

ANNUAL REPORT

LABORATORY AND X-RAY SERVICES DIVISION
MANITOBA HEALTH SERVICES COMMISSION

APRIL 1, 1983 - MARCH 31, 1984

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LABORATORY AND X-RAY SERVICES DIVISION

ANNUAL REPORT

1983-1984

INTRODUCTION

The Laboratory and X-Ray Services Division of the Manitoba Health Services Commission is comprised of two main components: the rural laboratory and x-ray units (LAXUS) and the Cadham Provincial Laboratory (CPL).

The CPL provides diagnostic and public health services including bacteriology, virology, mycology, parasitology, serology, reference chemistry and metabolic screening; LAXUS provides diagnostic services encompassing laboratory, x-ray, Ultrasound and EKG disciplines.

During the 1983-84 fiscal year reference chemistry services within the CPL were improved with the consultation services provided by Dr. Paul Desjardins from the Health Sciences Centre. A review of premarital syphilis testing indicated that this program was not meeting the original objectives; as a result, the legislation was repealed and the number of tests for syphilis reduced accordingly.

This fiscal year saw the implementation of computer programs for Clinical Microbiology (May 83) and Virus Isolation (October 83). Benefits derived from these programs include increased response time to physician enquiries, computer generated Statistics Canada Units and computer generated reports on positives, reportables, etc. The CPL has implemented an electronic messaging of reportable diseases to the Department of Health Communicable Disease Control section to provide fast and efficient results to them.

SENIOR STAFF LISTING

DIVISION DIRECTOR	-	J.C. Wilt M.D., FACP, FRCP, FRC (Path), FRS
LABORATORY PHYSICIANS	-	J.G. Fox M.D., FRCP(C), Dip. Bact. (Tor)
	-	G.W. Hammond M.D., FRCP(C)
	-	L.H. Sekla M.D., B.Ch., DTM&H, D.M., Ph.D.
	-	T.W. Williams M.D., B.Ch., DPH, FRCP(C), (Ped & Micro)
	-	J.T. Lunn M.D., Radiological Diagnostician
MANAGER, RURAL UNITS	-	M.W. Burroughs FCAMRT, A.C.(R), R.C.T.
ADMINISTRATIVE OFFICER, CPL	-	J. Thompson
<u>SCIENTISTS:</u>		
DIVISION PHYSICIST	-	D.E. Gelskey M.S., MPH, Dr. P.H.
ENVIRONMENTAL MICROBIOLOGY	-	W. Stackiw B.Sc.
METABOLIC DISEASES	-	R. Hoare Ph.D.
CLINICAL MICROBIOLOGY	-	A.C. Maniar M.Sc., Ph.D., D.Sc.
SEROLOGY	-	W. Stackiw B.Sc.
VIRUS ISOLATION	-	G. Ahluwalia B.Sc.
<u>REGIONAL SUPERVISORS:</u>		
EASTERN MANITOBA: X-RAY	-	L. Wilson, R.T., R.C.T.
LABORATORY	-	Wm. Strukoff, DHA, R.T.
WESTERN MANITOBA: X-RAY	-	E. Carroll, R.T., R.C.T.
LABORATORY	-	W. Yaschyshyn, R.T.

NURSE EPIDEMIOLOGIST	-	D. Phippen, Reg. N.
DIVISIONAL SPECIALIST TECHNOLOGIST	-	S. Giercke, A.R.T.
<u>EDUCATION OFFICERS:</u>		
LABORATORY	-	A.N.C. Delaat, A.R.T.
X-RAY	-	J.D. Brownlee, B.Sc., R.T.
<u>ACCOUNTING/STORES:</u>		
ACCOUNTING CLERK	-	C. McComber
<u>STOREKEEPERS:</u>		
RURAL UNITS	-	Wm. Popoff
C.P.L.	-	D. Chapman
<u>CHIEF TECHNOLOGISTS:</u>		
CLERICAL SUPERVISOR	-	P. Flint
CLINICAL MICROBIOLOGY	-	R. Barker, B.Sc., R.T.
ENVIRONMENTAL MICRO.	-	S. Dzogan, B.Sc., R.T.
METABOLIC DISEASES	-	R. Thompson, R.T.
SEROLOGY/PARASITOLOGY	-	G. Eibisch, R.T.
TECHNICAL SUPPORT	-	A. Norrie, R.T.
VIRUS ISOLATION	-	B. Klisko, R.T.
<u>RURAL UNITS:</u>		
INTERLAKE AREA	-	L. Russell, R.T.
SELKIRK	-	D. Sirett, R.T.
SOUTHERN AREA	-	L. Baker, R.T.
SWAN VALLEY AREA	-	E. Kindrat, R.T.
VIRDEN AREA	-	P. Rocan, R.T., R.C.T.
SOUTHWEST AREA	-	B. Phillips, R.T.
RUSSELL AREA	-	D. Preston, R.T.
NEEPAWA AREA	-	L. Novak, R.T.
DAUPHIN AREA	-	E. Slimmon, R.T.
PORTAGE AREA	-	D. Fotheringham, R.T.
CHIEF E.C.G. TECHNOLOGIST	-	L. Brooks, R.C.T. (Adv.)

PERSONNEL REPORT

During 1983/84, the Division welcomed new staff:

Miss B. Jacks	Administrative Services, CPL
Miss D. Pugh	Technical Support, CPL
Miss L. Caparas	Technical Support, CPL
Mr. G. Smart	Environmental Microbiology, CPL
Mr. R. Keryanshi	Gimli Lab and X-Ray Unit
Miss W. Wark	Pine Falls Lab and X-Ray Unit
Mr. G. Dubety	Portage Stores
Mrs J. Race	Dauphin Lab and X-Ray Unit
Miss R. Field	Ste. Rose Lab and X-Ray Unit
Miss M. Enns	Morden Lab and X-Ray Unit
Miss T. Robinson	Virden Lab and X-Ray Unit
Mrs L. Flatt	McCreary Lab and X-Ray Unit
Mrs P. Bogers	Roblin Lab and X-Ray Unit
Mrs J. Pickover	Carmen Lab and X-Ray Unit
Mrs E. Hiebert	Winkler Lab and X-Ray Unit
Mrs L. Bryce	Killarney Lab and X-Ray Unit

Staff who left the Division during the year:

Mrs A Koswoski	Metabolic Diseases, CPL
Mr. M. Drewniak	Environmental Microbiology, CPL
Dr. R. Hoare	Metabolic Diseases, CPL
Mrs S. Foley	Administrative Services, CPL
Miss W. Willis	Administrative Services, CPL
Miss M. Bell	Metabolic Diseases, CPL

Mr. J. Muir	Administrative Services, CPL
Miss V. Sobkow	Gimli Lab and X-Ray Unit
Mrs L. Bryce	Killarney Lab and X-Ray Unit
Miss D. Watkins	Morden Lab and X-Ray Unit
Mrs F. Brown	Stonewall Lab and X-Ray Unit
Miss C. Still	Pine Falls Lab and X-Ray Unit
Mrs A. Wait	Dauphin Lab and X-Ray Unit
Mrs J. Swain	Morris Lab and X-Ray Unit
Dr. J. Lunn	Divisional Radiologist
Mrs M. Gray	Virden Lab and X-Ray Unit

Congratulations go to:

Mr. Brian Cwir, R.T., Ultrasound Technologist posted at Dauphin, passed his certification exams in June, 1983, and is now registered with the American Registry of Diagnostic Medical Sonographers.

Mr. James Loeppky, R.T. (Lab) promoted to Charge Technologist at Birtle effective April 2, 1984, a position he held in acting status since September 12, 1983.

Mrs. Fran Preston, R.T., appointed June 11, 1983, Technical Specialist of the Virden area.

Mrs. Charlotte Klassen, R.T., appointed August 2, 1983, to Section Head of the Laboratory at Killarney.

Mrs. Shirely Dzogan, R.T., appointed Chief Technologist, Environmental Microbiology, CPL in June, 83.

Mr. David Kan, R.T., appointed in April 1983 as Supervisor, Clinical Microbiology, CPL.

ADMINISTRATIVE SERVICES SECTION

The Administrative Support Section is comprised of several highly diversified subsections which are:

- Accounting
- Building Management
- Clerical/Secretarial
- Data Processing/Specimen Receiving/Mail
- Stores/Purchasing

During this fiscal year, the impact of computerizing Clinical Microbiology (May 83) and Virus Isolation (October 83) was acutely felt in the clerical and data processing areas. Manual processing of requisitions and reports, filing, recording positives, Statistics Canada Units, preparation of weekly reports, all became unnecessary with the changeover to automation. The workload, however, increased accordingly in the data processing area since data entry procedures require entry of more information than the manual system did.

Computerization has enabled us to dump reportables on hardware located in the Department of Health, Communicable Disease Control thus eliminating telephone and messenger delivery of these reports.

Implementation of the two computer programs impacted heavily on the specimen receiving/mail area. The interaction between receiving/mail and data processing increased to the point where a supervisor was appointed to bring these two areas together in a functional relationship.

The building management area, including repairs and maintenance to equipment, building and grounds plus housekeeping and security, was active during this year with the installation of cross connection and backflow preventers to upgrade the protection of the water supply. The building engineer has now been licensed to test and inspect these protective devices.

A continuing problem of insufficient quantities of R.O. water was finally traced to inappropriate settings on the washers; since adjusting the flow of R.O. water to these machines, our supply problem has finally been resolved.

Inadequate storage space and the need for a computerized inventory system remain as unsolved problems in the Stores operation. Activities to resolve these two areas will continue, hopefully, to be resolved in the next fiscal year.

CLINICAL MICROBIOLOGY

Data handling in Clinical Microbiology is now largely done by computer. Many of the start-up problems have been solved and we are appreciative of the help in this matter received from both CPL and Manitoba Health Services Commission, Data Processing staff. Some fine tuning of the system still remains to be done and hopefully this will be accomplished during the next fiscal year. Computerization has allowed us to monitor antibiotic resistance patterns: in the last year for example, the percentage of *E. coli* and *Klebsiella* organisms resistant to Trimethoprim Sulpha has doubled, possibly reflecting the widespread use of this agent in treatment and suppression of urinary tract infection. Should such a trend continue, the usefulness of this agent could be greatly reduced within a few years.

In 1980, an outbreak of *Shigella Sonnei* dysentery swept Northern Manitoba; these organisms were resistant to many antibiotics. In 1981 and 1982 the number of *S. sonnei* isolated was greatly reduced and the organism with multiple antibiotic resistance was no longer present. The latter half of 1983 has seen an upswing in the number of *S. sonnei* isolates and the majority of these are again resistant to Ampicillin and Trimethoprim Sulpha. The reason for such fluctuations is unknown.

Research and Development

A comparative study of seventeen different urine dip-slide culture systems was conducted in collaboration with some rural LAXUS units. This study assessed not only the ability of each

system to perform adequately from the microbiological viewpoint, but also how well each would survive the hazards of transport from point of origin to the testing laboratory. This procedure will be repeated periodically (yearly being the most frequent) when manufacturers claim to have produced a better product which might be more satisfactory in meeting LAXUS needs.

The availability of monoclonal antibodies for Chlamydial detection has made possible the testing of smears for evidence of the presence of this organism in patients with sexually transmitted diseases. The rapidity and relative ease of such testing are being compared with our usual culture technique; however, further testing is both necessary and ongoing. To this end collaboration studies with H.S.C., Med. Micro, C.F.B. and selected clinics are being actively pursued. Early results suggest that the antibody detection technique may be the test of the future for Chlamydia.

The Divisional specialist technologist continues to provide invaluable support to the Division. Training of rural technologists for deployment in rural microbiology laboratories; on-site reviews of rural programs and trouble-shooting in these programs, plus continuing technical training in microbiology at the technical level were activities undertaken during the year.

Another aspect of this work is the evaluation of new and better methods of testing for pathogenic organisms and the suitability of such systems in a rural setting. Gonozyne has been tested extensively in collaboration with H.S.C., Med. Micro. and selected clinics and has been introduced recently as a routine test for isolated northern areas.

Gonozyne allows the detection of the organisms which cause gonorrhoea much more rapidly and reliably in the northern setting. In the past many of these organisms failed to survive the rigors of cold and delay inherent in northern transportation. Gonozyne circumvents these problems in that the organisms can be detected even after they have died, by Enzyme Immunoassay.

The Provincial Nurse Epidemiologist continues to provide service to rural hospitals and Personal Care Homes. Consultative services have received acclaim from the infection control practitioners and administrators of these facilities. Short training courses have been provided for these practitioners as well as on-site in-service continuing education in infection control. Recently, Miss Phippen accepted an invitation from the Nosocomial Infection Control section of the Laboratory Centre for Disease Control (Ottawa) to provide expertise to aid them in producing a manual for infection control programs for Canada. They had seen the Manitoba Infection Control manual which she had helped to draw up and have used much of this in their manual.

VIRUS DETECTION LABORATORY

The Virus Detection Laboratory is responsible for a full range of diagnostic tests for detection of viruses or viral antigens (except Hepatitis B viruses) and for the serodiagnosis of enterovirus infections by the microneutralization test. We continue to have an increasing number of specimens for virus detection with 14,115 submitted during the past fiscal year; an increase of 23% over the previous year. The protocols which have been developed to cope with this increased workload have remained relatively unchanged from the previous year. Our technical staff continue to develop areas of specific expertise as four now perform electron microscopy, two perform fluorescence microscopy and two perform microneutralization serology. We have had two particularly busy seasons, with a large enterovirus season in the summer of 1983 and an active respiratory virus infection season in the winter of 1983-84. Our summer help in 1983 was D. Trosky who assisted greatly in our hectic enterovirus season. The Rotalux test for the detection of rotaviruses has proven to be a useful and rapid screening test for the presence of rotavirus from December of 1983 to the end of March 1984. The greatest change in the routine function of the laboratory was the introduction of computerized reporting of laboratory results. This required a great deal of discussion and preparation before it was finally introduced, but with the assistance of the programming staff at Manitoba Health Services Commission and the C.P.L. clerical staff, this reporting system is working very efficiently. Much useful clinical, epidemiological and laboratory management information will be derived from this computerization.

HIGHLIGHTS

1. VISITORS:

We were fortunate to be the host city of the Canadian Society of Microbiology meeting in June of 1983 at which time Dr. K. Rozee (Halifax), Dr. M. Petric (Toronto), Dr. M. Chernesky (Hamilton) and Dr. F. Doane (Toronto) all visited and toured the C.P.L. facilities. Useful discussions were held on the role and management of diagnostic virology laboratories. Dr. R.E. Hope-Simpson (Cirencester, England) gave an interesting seminar on "A New Look at Influenza Infections in Man" in September. In conjunction with a visiting professor program to the Department of Medical Microbiology, Dr. L. Tyrrell (Edmonton) visited the C.P.L. in February of 1984. As a special guest to the C.P.L., Dr. M. Anderson from London, England visited in March of 1984 and gave three seminars on human parvoviruses - the biology, association with rash illness and the diagnosis of parvovirus infections.

2. ENTEROVIRUS OUTBREAKS:

In the summer of 1983, a serious neonatal outbreak of enterovirus infection occurred in the neonatal nursery at the St. Boniface General Hospital. Our laboratory processed several hundred specimens for virus culture and serodiagnosis in collaborating with the outbreak investigation team, from staff at the St. Boniface General Hospital, the Laboratory Centre for Disease Control in Ottawa, and the Centre for Disease Control, Atlanta, Georgia. Both echovirus 11 and coxsackievirus B4 viruses were implicated in this outbreak investigation, which concluded with very many useful recommendations to prevent such outbreaks in the future. A second large nosocomial outbreak of enterovirus infection occurred at the St. Amant Centre. In conjunction with his rotation

through the Cadham Laboratory as part of his training in Community Medicine, Dr. Ian Johnson did a very commendable job of the investigation of this coxsackie B4 outbreak. This also generated useful information on the transmission of this infection and suggestions for prevention of future epidemics in the institution.

3. INFLUENZA:

The influenza season of 1982-83 extended into June with isolates of A/H₃N₂ (Philippines), A/H₁N₁ (Brazil-like) and B (Singapore) isolates. In the spring of 1984 a high rate of absenteeism among school children was noted in the Province of Manitoba. Over 30 isolates of influenza A/Brazil-like strains and four isolates of influenza B USSR have been detected over February and March, 1984.

COLLABORATIVE PROJECTS

1. HUMAN PARVOVIRUS INFECTIONS:

The most exciting development for the year was a resolution to the rash illness outbreak of 1980. From stored specimens, recently submitted to Dr. M. Anderson, London, England, our prospective outbreak of erythema infectiosum in the Spring of 1980 was conclusively shown to be due to a new human parvovirus. This was the first detection of human parvovirus in this illness.

2. HERPESVIRUS STUDIES:

In collaboration with Dr. F. Aoki, we continue to perform diagnostic virology in North American collaborative studies on neonatal herpes simplex infections (three known deaths from January to March 1984) and

herpes simplex encephalitis therapeutic studies. Additional studies of the treatment of recurrent herpes genitalis are also underway.

3. RESPIRATORY VIROLOGY AND HOSPITALIZED CHILDREN:

In collaboration with Dr. F. Aoki, and Dr. Pagtakhan, children hospitalized to the Children's Hospital with acute respiratory infections have been entered for clinical and diagnostic virology studies. Dr. Diaz-Mitoma has performed immunofluorescent studies with a battery of six reagents previously standardized by Mr. Ahluwalia. This study promises to be useful in the evaluation of these diagnostic reagents in this technique, and in learning about the clinical spectrum of illness in these children. This study may serve as a basis for a future therapeutic study in the following years.

4. IgM DETECTION OF COXSACKIE B VIRUS ANTIBODIES:

Mr. Donald Chan has completed his investigation of the ELISA test for detection of IgM antibodies to coxsackie B viruses and his thesis has been submitted.

5. ADENOVIRUS GASTROENTERITIS STUDY:

The entry of patients into this study was completed on December 31st. Techniques of diagnosis by culture on 293 cells and analysis of isolates by restriction endonuclease digestion has been a useful spin-off from this externally funded project.

6. CENTRAL NERVOUS SYSTEM INFECTION STUDY:

Entry of patients into this study was completed on March 31st. In addition to the collaborative projects listed above, laboratory research and development projects include diagnosis of rubella infections by the development of a fluorescence assay. The photo-inactivation of infectious virus with the use of psoralens has been evaluated and found to be effective.

The assistance of our summer student, Mr. J. Joshua (with Ms. G Mauthe and Mrs. H. Lukes of the adenovirus study) has enabled us to identify unknown adenoviruses with the use of restriction endonuclease digestion.

CELL CULTURE LABORATORY

We continue to have excellent cell culture resources under the direction of Mr. R. Drummond with the assistance of Mrs. G. Allan. In addition to the final preparation of commercial cell cultures, the preparation of media and the quality control of all the reagents are the important functions of this laboratory. In the past year, we have increased our efficiency of media production with the use of a new 40-liter tank. New cell lines are undergoing testing for routine use including 293 cells and HL cells. The production of monoclonal antibodies to adenovirus hexon from a suspension culture of a hybridoma cell line is the first in what will probably be many antisera produced by this method.

ENVIRONMENTAL MICROBIOLOGY

HIGHLIGHTS OF 1983 - 1984 ARE AS FOLLOWS:

1. The Roblin study on the microbiological hazard of spray irrigation of sewage effluent on agricultural land was continued for the second summer. Pathogens (such as Echovirus 11, Poliovirus 1 to 3, Coxsackie B4, and Salmonella sp.) were isolated from the raw sewage entering the lagoon. Bi-weekly testing of the lagoon effluent did not yield any pathogen, and the Coliform counts fell within the permissible range. Three different methods of air sampling were compared (Anderson sampler, Spiral air sampler and Open plates). On one occasion, the counts of Gram negative bacteria were higher near the spray area than at a distance of 1000 meters.
2. In collaboration with the City of Winnipeg, 4 daily "fill and draw" wading pools were studied to determine the effect, if any, of filtration, on the microbiological quality of their water. The study did not show any advantage for filtration which is an expensive step. No pathogens were identified, but 8 organisms displayed multiplied antibiotic resistance. Dr. I. Johnson, a community medicine resident, is submitting this study for publication in the Canadian Journal of Public Health.
3. Tests on recreational waters were continued. In collaboration with the Environmental Management Division (EMD), tests were done on various Lake Winnipeg beaches. Part of this investigation

was triggered by a Winnipeg Free Press report indicating that the water quality was unacceptable. This study of recreational waters is to be continued in the summer of 1984.

4. Studies on the Red River Microbiological Quality were continued in collaboration with EMD. Results were incorporated in a submission to Cabinet which led to the formation of a tripartite technical working committee on the Red River Water Quality. As well, the virus data were presented by EMD staff to a National Water and Waste Seminar. Resistance to multiple antibiotics was demonstrated in 61 gram negative bacteria; transfer of resistance was documented on one organism isolated from sewage effluent. Poliovirus and Reovirus 1 and 2 were isolated from Winnipeg sewage.
5. Requests for the detection of Hepatitis A virus in drinking water continued to be received from various parts of the province, particularly from the northern areas where outbreaks have been reported. Using experimentally seeded waters, several methods for concentration and elution were compared: 1. absorption-elution from negatively charged 0.45 um membranes; 2. ultra-filtration using Amicon 30,000 molecular weight membranes; 3. ultra-centrifugation; 4. electropositive filtration. Casein (0.5% isoelectric at pH 9.0) was used for elution followed by organic flocculation. Hepatitis A virus was detected by a modification of and existing radio-immuno assay for Hepatitis A IgM antibody

(Abbott's Laboratories). In addition, immuno-electron microscopy was tried to confirm the presence of virus. To date the best results have been obtained with the Amicon ultrafiltration procedure. It appears that an unusually large volume of water must be concentrated for the virus particles to be detected by either immune electron microscopy or by radio-immuno assay. To improve the recovery of virus further work is needed to determine whether inactivation with formalin is altering the surface charges of the Hepatitis A virus used for the seed experiments.

6. Tests for the detection of Legionnaires's bacilli in environmental samples were continued. Despite some positive direct immuno-fluorescent smears, all cultures were negative. A variety of procedures was compared, but more work is needed to improve our recovery rates. We are currently looking at: 1. adding some supplements to the media to encourage growth; 2. eliminating the recommended acid treatment which was shown to reduce growth markedly in our seeding experiments.
7. A study to determine the effect of water turbidity on the detection of Coliforms was continued. In contrast to reports from other researchers, no variation was noticed when membrane filtration was compared with the most probable number procedure.
8. Outbreaks of Shigella at Ebb and Flow and Norway House lead to requests for testing of drinking and lake water. All attempts at isolating Shigella were unsuccessful.

9. A membrane filtration method is being evaluated for the detection of *Pseudomonas* in water. An outbreak of rash illness was noticed in persons from Saskatchewan who used the same whirlpool while visiting Winnipeg. An investigation, sponsored by the late Dr. W. French, lead to the demonstration of *Pseudomonas aeruginosa* group 6 in the whirlpool water, as well as in the skin lesions. Serogroup 6 is rare in Canada having been reported mainly from Australia.
10. A membrane filtration technique is currently being investigated for the detection of yeast in water. There is heightened awareness of indoor air quality in homes and at the workplace; as a result, an increasing number of samples of humidifier and air-conditioning waters and filters are submitted for detection of bacteria and fungi. Air Microbiology quality is becoming an environmental and occupational issue.
11. Nitrate testing of well water was discontinued in 1984 as the spot test performed at the CPL was not accurate enough. In agreement with the W. Ward Technical Services Laboratory, the Environmental Control Services, Community Health, and the Westman Laboratory, requests for nitrate tests are referred to the Ward Laboratory.
12. Agriculture Canada has requested Standard Plate Counts and tests for Total Coliforms on egg wash waters. Veterinarians at the Winnipeg Zoo requested similar tests on hydroponic water. Public

Works Canada requested tests for bacteria and fungi on water samples collected from a federal building in Manitoba.

13. The food microbiology section had a busy year, in part due to the activities of Manitoba's food surveillance committee. The most salient features can be summarized as follows:
- a) High counts of *E. coli* were found in bean sprouts submitted by Winnipeg City Health officials.
 - b) *Staphylococcus aureus* was isolated from baby food in one incident, from chicken and beef sandwiches in another, and from a rice and meat mixture in a third one. *Staph. aureus* was detected in spanish sauce and in bulk grated cheese.
 - c) *Clostridium perfringens* was isolated from cabbage rolls served in a Winnipeg restaurant and from gravy and meatballs submitted from Portage la Prairie.
 - d) High *E. coli* counts have been reported in egg sandwiches obtained from different "commissaries" and/or restaurants. Resampling and review of sanitary procedures did not improve the quality of these sandwiches, which are very popular fast food items often consumed at the work place or by travellers.
 - e) The routine surveillance of ice cream mixes sponsored by the City of Winnipeg resulted in the removal of a dozen ice cream freezer units. In particular, four establishments were noted to have high bacterial counts on more than three occasions.

14. Western Equine Surveillance Program

Despite early predictions for a non-epidemic year, ideal weather conditions resulted in an outbreak of Western Equine Encephalitis (WEE) in 1983. The first indication of an impending outbreak was the massive seroconversion detected in the first post-exposure blood samples obtained from sentinel chicken flocks, placed in various locations of the Province. Over the summer, 272 of 1,318 chickens (33%) developed WEE antibodies. The Western Equine Encephalitis virus was isolated in mosquitoes; in all 50 WEE, 14 Hart Park Flanders, 2 California Encephalitis and 5 Cache Valley were isolated and identified from 1633 pools tested. The Minister responsible for the Environment ordered a survey of wild birds. All serological tests were performed at the CPL and showed WEE antibodies in geese, pheasants and sparrows. Results of the WEE surveillance in 1982/83 and in 1983/84 are detailed in a separate table. In 1983, 18 human and 23 equine cases of WEE were laboratory confirmed.

Efforts to improve the laboratory diagnosis of WEE were continued. A comprehensive manual of methods has been compiled; methods for mosquito submission and treatment were revised; plaquing will be introduced in 1984 for the rapid (with 2 days) detection of WEE virus in mosquitoes using duck and chick embryonic cells. Finally, a highly sensitive and specific plaque-reduction technique has been developed for the detection of WEE antibodies.

SEROLOGY/PARASITOLOGY

THE HIGHLIGHTS ARE AS FOLLOWS:

1. The compulsory pre-marital syphilis testing was terminated in the Fall of 1983 when it became clear that the population at risk was not affected by this surveillance. Of the 23 new cases of syphilis detected in 1983, one was pre-marital, one pre-natal, and over 21 were homosexuals. Re-infection was documented in 4 individuals.
2. Requests for Hepatitis A Virus (HAV) and Hepatitis B (HBV) tests were on the increase. In certain northern communities, HBV and HAV were found in the same family and sometimes in the same person. An outbreak of HAV in The Pas was confirmed serologically and investigated epidemiologically by Dr. I. Hohnson, a community medicine resident. Immunization of Haemodialysis patients at the Health Sciences Centre, using the Heptavax B vaccine (Merck, Sharpe and Dohme) was followed by testing for Anti HBs; only 44% of the vaccinees developed Anti HBs; renal transplant patients responded poorly to this vaccine. In preparation for vaccination, testing for HBV markers was done in 2 mental institutions. Extensive testing was conducted on homosexuals; almost 50% of whom were positive for HBV markers. An enzyme-linked immuno-assay (ELISA) replaced the radio-immune assay (RIA) for the detection of HBsAG. Late in March, 1984, an ELISA test was introduced for the detection of Anti HBc IgM antibodies (Abbott Laboratories). It will be of value in interpreting the serological results in patients in the "core window". Patients who are IgM Anti HBc may be considered potentially infective.

3. Pre-marital testing for rubella was discontinued in the Fall of 1983. The pre-natal screening indicated that 96% were immune to rubella. Over 250 cases of recent infections were laboratory-confirmed during the year; 8 of these were pregnant females; 4 of their infants were tested and found to have no specific IgM antibodies; no follow-up information is available on the other pregnancies.
4. Breast milk donors continued to be tested for Hepatitis B Surface Antigen (HBsAg) and for antibodies to Cytomegalovirus (CMV). Positives were excluded from the programme. No carriers of HBsAg were detected in this group, while 27.6% of the potential donors were found to have CMV antibodies at titers of 1:8 or greater.
5. Seven persons were proven to have had Legionnaires' disease in 1983-84 based on four-fold rise in antibody titers in 4, four-fold drop in titers in 2, and a single high titer in a person on whom a sero-type 1 L. pneumophila was isolated. At least 14 persons had high antibody levels and a clinical illness compatible with Legionnaire's disease. The age distribution showed more infections in the over 60 age group (12 persons), followed by the over 40 group (6).
6. The detection of specific IgM antibodies to Toxoplasma gondii confirmed a recent infection in 7 persons. The diagnosis was suspected clinically in 3 cases (born in 1957, 1964 and 1979 respectively); the most common symptomatology was a febrile

illness with a lymphadenopathy; when performed, histological examination of the lymph nodes confirmed the serodiagnosis.

Four of the cases were in pregnant females (age 23 - 33), one of whom had a spontaneous abortion; 2 demonstrated a sero-conversion, as well as IgM antibodies.

7. There has been an increase in the number of cases of Infectious Mononucleosis confirmed by a specific IgM EBV test. Occasionally this test detects antibodies in persons with heterophile antibodies.
8. Influenza A and Influenza B viruses, as well as Adenovirus, Parainfluenza and Mycoplasma pneumonia were prevalent late in the winter of 1984. Two persons were shown to have IgM specific antibodies to Influenza A.

An elderly lady died of a Diphtheria infection, serological tests had shown an absence of diphtheria antitoxin in her serum.

9. Several studies were conducted in collaboration with other researchers, e.g.:
 - a) Herpes simples, herpes zoster, Cytomegalovirus, Epstein-Barr Virus, Western Equine Encephalitis virus were documented as causes of encephalitis/myelitis in the Central Nervous Study headed by Dr. G. Hammond.
 - b) Dr. F. Aoki sponsored a study of the haemagglutination-inhibition test (HI) for differentiation of antibodies to various strains of Influenza A and B viruses in volunteers given vaccine, amantadine or placebos;

- c) A study of bronchial exacerbation in patients with chronic lung conditions required serological testing for respiratory viruses, Mycoplasma pneumonia and Legionella pneumophila;
 - d) Tests for the detection of Chlamydia trachomatis antibodies were conducted in collaboration with Dr. N. Kordova;
 - e) A one year study of Herpes simplex antibodies in manic depressive patients was requested by Dr. A. Harvey;
 - f) The immune status of medical and nursing students was determined for Herpes zoster, HAV and HBV as per Dr. A. Ronald's protocol;
 - g) A study of Cryptosporidiosis in Manitoba was started involving Dr. E. Mann, a veterinarian with Agriculture Canada, Dr. G. Nayar, of the Provincial Veterinary Services, Dr. G. Wiseman and Dr. R. Brunham of Medical Microbiology, Health Sciences Centre (HSC). Ten human cases and diseases in a dozen calf herds have been documented to date;
 - h) The study of Q-fever in sheep used as experimental animals in the Medical College was continued.
10. The parasitology section is still experiencing an increase in requests for testing. The National Reference Center for Parasitology is collecting data for a comprehensive epidemiologic one year study of parasitic diseases in Canada, and the CPL is participating in this endeavour.
11. Computerization of Serology has been recommended for implementation in 1984/85. In preparation, a complete review of this section is underway.

12. Interesting results were obtained by referring out sera to various National Reference Centers, e.g.:

- a) Candidiasis in a Winnipeg male born in 1894.
- b) Aspergillosis in a Winnipeg male born in 1919.
- c) Coccidioidomycosis in a male born in 1921 from Pine Falls.
- d) Cryptococcosis in a Winnipeg male born in 1921.
- e) Yersiniosis in a Winnipeg male born in 1964; this is the first positive serological result obtained in the last decade.
- f) An extremely high titer of Trichinella antibodies was reported in a male born in 1949; this patient, from Eskimo Point; had a severe diarrhea and an unusually high eosinophilia, fitting the picture of the recently reported Arctic Trichinosis. Another patient from Coral Harbour, a male born in 1959, had high antibody levels to Trichinella sp. as well.
- g) One case of Schistosomiasis, one of Filariasis, and one of Ascariasis were diagnosed serologically in patients with a history of recent travel.

13. A VARIETY OF NEW TESTS WERE EVALUATED DURING THE YEAR:

- a) ANTI-NUCLEAR ANTIBODY (ANA) FOR THE DIAGNOSIS OF COLLAGEN DISEASES:

ANA testing was introduced on a routine basis. The IDT (FIAX) system was evaluated along with 2 other system substrates. The IDT system was simpler to perform and did not require FA microscopy for screening. However, our findings indicate that

in comparison to substrates mounted on a slide; the fine speckled patterns were missed in most cases. We found that a KB cell substrate on a slide gave the best results overall.

b) RUBELLA-IgM DETERMINATION:

The sucrose-density gradient method has been replaced by an ELISA technique (Abbott) and is now in routine use. After comparing the two methods, it was found that the ELISA technique was more sensitive as it detected IgM (at a low level) in sera which were negative by sucrose gradient. In one instance a Rubella IgM positive by ELISA was also positive to EBV-IgM. It is not known whether there is a cross reaction or whether the individual had both infections.

c) CMV-IgM-ELISA (MEDAC):

This test was evaluated in 1982 and was found unsuitable. Modifications were made and the test re-evaluated in 1983. Results indicated that it was simple to perform, was sensitive in detecting CMV-IgM. No cross reaction was observed with high titered Rheumatoid Factor (RF) sera, ANA sera, EBV-IgM positive sera, H. simplex (sera demonstrating a rise in antibody titer) and in 3 out of 4 Varicella-Zoster positive sera. In one case, CMV-IgM was detected in a patient with a four-fold rise in antibody titer (16/512) to Varicella; this may be either a reactivation of a latent CMV or a false positive reaction.

d) SEVERAL ELISA TESTS WERE EVALUATED:

1) Chlamydia: This test (MA Bio-products) was evaluated against the CF and IFA tests, with comparable results. There

was general agreement with both tests, and disagreement in 2% of the cases (positive by ELISA where the other 2 tests were negative). This test would be of value in conducting sero-surveys, but has limited value in diagnosis.

- ii) Mumps: (MA Bio-products): This test was evaluated with the idea of replacing the HI test in determining immune status. The HI test presents numerous problems, mainly in the complete removal of non-specific inhibitors. The test procedure was relatively simple to perform and reagents were easy to prepare. High background levels in the controls was of some concern; the cost of the test was high. Agreement with the HI test was poor.
- iii) Varicella Zoster: (MA Bio-products): This test was evaluated vs the immune adherence hemagglutination test (IAHA) for determining immune status. The correlation between the two tests was good. Only one discrepancy occurred in 96 sera tested (paired sera which showed a rise in titer by IAHA give static O.D. values). Cost per test is high in comparison to IAHA; this test presents no advantage over the IAHA.
- iv) Measles: (MA Bio-products): This test correlated well with the standard HI procedure and offers no advantage over HI or CFT for diagnosis. Cost per test is high.
- v) CMV: (MA Bio-products): This test correlated well with the CF test and would be of value in serosurveys. Cost per test is high. No advantage over the CFT in diagnosis.

- e) RF - LATEX (Diagnostics Inc.): Evaluated because of the low cost per test in comparison to other manufacturers. Results show good correlation on the screen test. Quantitation is slightly more laborious. Titers were generally higher than that obtained with current test in use. Current test expresses titers in International Units which is an advantage.
- f) CMV-IgM-IFA (Gull): Evaluated on a limited number of sera. In one instance, paired sera showed a minimal rise in CF titers (32/64) in a patient on whom CMV virus was isolated. Both sera demonstrated high levels of IgM to CMV by this technique. Although more testing is required to fully evaluate the test, it appears promising.
- g) RUBELLA-IgG-ELISA: Two products were evaluated, Ortho Diagnostic and Abbott Laboratories. Both are good tests. Currently they provide no advantage over the PHA used for screening; PHA is less costly and less labor intensive. Both may be considered as a replacement for the HAI test.

14. Plans for the next fiscal year include a commitment for more rapid diagnosis using the ELISA procedure for the detection of IgM antibodies to Herpes simplex, Herpes zoster, Cytomegalovirus, Measles, Mumps, an agglutination or an ELISA for the detection of antibodies to Legionella species, and an IFA test for the detection of Coxiella burnetti. Additional tests for evaluation in 1984 include: diagnosis of auto-immune disease and hyper-sensitivity reactions.

TECHNICAL SUPPORT SERVICES

The Technical Support Section encompasses three services provided to Cadham Provincial Laboratory and the Rural Laboratory and X-Ray Units. These services include Quality Control, Media, and Washup/Sterilization.

QUALITY CONTROL SECTION

The Comprehensive Microbiology Proficiency Survey offered by the College of American Pathologists is co-ordinated by this section. Specimens are submitted to the appropriate subsection within CPL and deadlines for return of results are given. These proficiency surveys are monitored by the College of Physicians and Surgeons of Manitoba to determine accreditation.

Internal proficiency testing is routinely carried out in Clinical Microbiology, Virus Isolation and more recently Serology. Internal testing has provided us with the tools necessary to assess various media, reagents and procedures routinely used in the laboratory sections and make recommendations that would enhance our identification skills and shorten turnaround time.

Recently, virus stock cultures have been maintained and catalogued for use in the Virus Isolation proficiency program. As well, a Viral Serology Serum Bank has been established to provide specimens for submission to that section. Co-operation between various sections of CPL has been essential to make this program workable.

Microbiology proficiency testing in LAXUS has continued with specimens being submitted more frequently. We also provide those Units participating with the results of all participants soon after the survey is completed so that they can assess their own skills and compare with others in similar situations. Follow-ups on discrepancies are closely monitored to ensure procedures are followed as outlined in the Procedures Manual. The Gram Stain program is also reported to all Units participating in it. Staining and microscopic interpretation can vary from technologist to technologist and this program assists by providing the average result expected.

Updating and revisions of Q.C. manuals and procedures for students and new staff training in LAXUS and Cadham Provincial Laboratory are reviewed regularly and changes implemented to reflect current needs.

Stock cultures for microbiology were assessed for biochemical characteristics to maintain a record of the reactions of organisms sent for proficiency testing.

An assessment of Feeley-Gorman media vs. CYE (Charcoal Yeast Extract) was undertaken as a result of the difficulties encountered in the preparation and growth supporting capabilities of Feeley-Gorman Media with Legionella. As a result of the study, CYE is now prepared along with GVP (Glycine Vancomycin Polymyxin B) for isolation of Legionella.

MEDIA SECTION

This section prepares routine and specialized media, stains and reagents for CPL and LAXUS and transport media for users of our laboratory services. Various new formulations of selective media and reagents have been prepared to determine the feasibility of using alternate or additional media in primary and selective culturing.

New Formulations Include:

1. Bismuth Sulfite Tellurite Agar for isolation of *C. diphtheriae*: this media was found unsatisfactory.
2. Oxoid CYE Agar for isolation of Legionella: this media was satisfactory, but the costs of purchasing the dehydrated powder and supplements was prohibitive.
3. Oxoid TCBS (Thiosulphate Citrate Bile Salts) for isolation of *Vibrio cholera* and *Vibrio parahaemolyticus*: this media was satisfactory but at present there is no indication for routine usage.
4. Hoyles for isolation of *C. diphtheriae*: this media was unsatisfactory for our use.
5. Cystine Tellurite for isolation of *C. diphtheriae*: this media proved satisfactory and was implemented as a replacement for MTM for routine use.
6. Antibiotic concentrations and pH adjustments were implemented in Viral Transport Media.
7. CYE Agar for isolation of Legionella: This media proved satisfactory and replaced F-G Agar in routine use.

Demands for transport media such as viral and chlamydial have steadily increased and Amie's with charcoal is now provided to all Lab and X-Ray Units after studies indicated the superiority of this media in transporting *N. Gonorrhoeae*.

Procedural changes for testing sheep blood became necessary when contamination rates steadily increased. With the implementation of the new procedure, contamination is avoided before plates are poured, thereby preventing wastage of labor, reagents and petri dishes.

An 8-litre Barnstead Glass Still has been purchased to provide a more consistently reliable source of quality water.

Renovations have occurred in the Media Section to allow for a better workflow and a less hazardous environment.

WASHUP/STERILIZATION

This section has seen a steady increase in the volume of glassware and pipettes sterilized, washed and dried over the past year. Cost studies indicate that expenditures would be excessive if more disposables were used at this time. Until ventilation problems at Portage Lab and X-Ray Unit are rectified, we are performing the washup of various malodorous containers for them at CPL.

This section is also very crowded and renovations have occurred that have alleviated the problem somewhat.

METABOLIC DISEASES AND CHEMISTRY

During the period April 1, 1983, through March 31, 1984, the newborn screening program uncovered 9 significant findings. These were:

- 5 congenital hypothyroidism
- 1 cystinuria
- 1 galactosemia
- 2 histidenemia

During the year, this section put into operation a technique to quantitate galactose and galactose-1 phosphate from blood specimens collected on filter paper employing the Multistat III analyzer.**

Technical subcommittees in disease of metabolism and endocrinology were established to deal with specific problems and make recommendations to the Provincial Perinatal Screening Committee.

The Cholinesterase Screening Program for workers engaged in the use of organophosphate insecticides was expanded to encompass rural Manitoba. During the year, 74 applicators were sampled and 410 tests were performed. As a result of the testing program, one seasonal applicator was removed from spraying because of a significant fall in his cholinesterase values. Cholinesterase testing is now offered to those engaged in handling organophosphate compounds on a year-round basis.

In the diagnostic chemistry section by year-end, thyroid function, lipoprotein fractions, iron and TIBC, B12 and folates were on-stream.

Method evaluation, clinical and correlation studies on AFP test kits supplied by various manufacturers commenced by year-end in the event that approval for a material screening program is forthcoming.

** This new technique resulted in the diagnosis of a Galactosemia/Duarte heterozygote.

LAXUS: LABORATORY - EASTERN REGION

NEW PROGRAMS

Institution of a partial microbiology program at the Beausejour Laboratory and X-Ray Unit to include the culturing of throat swabs. Future considerations for expansion are currently workload/staff dependent.

The institution of diagnostic blood alcohol analysis at the Churchill Laboratory and X-Ray Unit.

The institution of the Ames Seralyzer Chemistry analyzer utilizing the dry chemistry principle for the blood glucose and blood urea nitrogen testing program at the Whitemouth Laboratory and X-Ray Unit.

The institution of cardiac enzyme analysis and the addition of a coagulation procedure to complement the hemostosis profile at the Churchill Laboratory and X-Ray Unit.

The introduction and the institution of a new procedure for the manual determination of blood glucose levels by the glucose oxidase method to all Laboratory and X-Ray Units performing blood glucose analysis by the manual method.

The successful resolution of specimen transport media production and distribution with the Cadham Provincial Laboratory.

UPGRADING PROGRAMS

Chemistry program upgraded at the Portage Laboratory and X-Ray Unit with the introduction of the Gilford System 103. This program semi-automates the blood glucose and urea nitrogen test procedures.

Central office spare electrolyte analyzing equipment upgraded.

Electronic cell counter (Hematology) Sysmex TOA CC-130 analyzer with WBC, RBC, Hemoglobin and Hematocrit capabilities installed at the Arborg, Morris, Lac du Bonnet and Stonewall Laboratory and X-Ray Units.

Blood mixing apparatus installed at Morden, Swan Lake, Gimli, Eriksdale and Vita laboratories.

Circulating constant temperature water baths installed at Altona, Morris, Carman, Winkler and Teulon Laboratory and X-Ray Units.

Illuminated flow-through urine specific gravity testing apparatus installed at Winkler, Swan Lake, and Selkirk Laboratory and X-Ray Units.

Centrifugation - new upgraded centrifuges installed at Gimli, Steinbach, and Arborg.

Ames Seralyzer Reflectance photometer installed at the Whitemouth Laboratory and X-Ray Unit.

Automatic pipettor/dilutor which complements the Gilford 103 chemistry analyzer installed in the Steinbach laboratory.

Electronic cell counter (Hematology) Sysmex TOA CC-170 with WBC, RBC, Hemoglobin, Hematocrit, blood cell indices and microprocessor controlled data storage and calibration capabilities installed in the Steinbach laboratory.

Coagulation (Hematology) analyzer equipment - Electra 750 MLA Cogulation timer installed in the Portage laboratory.

Semi-automated 1:500 ratio blood dilutor installed in the Vita laboratory.

Microscopy - upgrading of Microscopes at the Gimli, Carman and Selkirk laboratories.

QUALITY CONTROL PROGRAMS

The Division continues to monitor and ensure quality of laboratory analysis by participating in the following internal and external Quality Assurance Programs:

The College of American Pathologists Quality Assurance Program, both basic and XL series.

Microbiology - a comprehensive gram staining, sensitivity testing and culture identification Q.C. program co-ordinated for the participating Laboratory and X-Ray Units by the Quality Control Section of the Cadham Provincial Laboratory.

Commercial Hematology control cells (internal program on all electronic cell counting apparatus).

Ames Urinalysis program.

During this past year the Division participated on an ad hoc committee with the College of Physicians and Surgeons of Manitoba to plan future direction of intra-provincial quality control programs.

RESEARCH AND DEVELOPMENT

Commercial Hematology control cells evaluated (Hematall).

Blood Sedimentation rate (Sediplast) method and apparatus evaluated.

Commercial blood cells (para 7) for control purposes evaluated.

The Baker Instruments line of cell counters evaluated on location in demo lab.

BDH diluterge and lysing agents (Hematology reagents) evaluated.

On-site Radiometer blood gas model ABL 3 system evaluated.

On-site demonstration of Coulter Electronics full line of cell counting apparatus.

Specimen mailing container evaluation.

Procedure manual revised.

Consumable supply catalogue revised.

Evaluation of the Ortho Diagnostics ELT 8 cell counting apparatus.

In process of co-ordinating evaluation of two major manufacturers of cell counting apparatus.

Much effort goes into the evaluation of instruments and products during the year and it is through the efforts of staff at the Laboratory and X-Ray Units that these processes take place and consequently effective decisions made.

CONSTRUCTION AND/OR RENOVATIONS

Renovations/construction completed at Arborg, Selkirk, and St. Claude laboratories.

Renovations/construction at the Functional Program stage at Pine Falls, Steinbach, Gillam, Vita Laboratories.

Renovations/Construction currently in progress at the Altona laboratory.

OBJECTIVES 1984/85

Evaluation and ultimate replacement of a major cell counting apparatus.

Continued assessment and evaluation of state-of-the-art methodology and equipment.

Continued upgrading of diagnostic instrumentation.

Investigation of current Laboratory services in various locations with the view of further expansion or deletion of certain testing programs.

LAXUS: LABORATORY - WESTERN REGION

The emphasis during the past year has continued to be an upgrading of existing laboratory programs. Most capital purchases were restricted to small items, eg., cell counters, centrifuges, etc.

BRIEF RESUME OF CAPITAL PURCHASES:

Flin Fon: Fully automated 7 parameter hematology analyzer, Coulter S 770.

The Pas : Semi-automated chemistry analyzer as back up to the Gemeni.

Killarney: Semi-automated blood gas analyzer.

Souris: Semi-automated chemistry analyzer, Gemeni.

Deloraine,: Upgrading, 3 parameter hematology analyzers.

Birtle, : " "

Crystal City:" "

Souris,: Upgrading, ION selective, electrolyte analyzers,

Minnedosa,: and

Neepawa: centrifuges.

Birtle,: Upgrading spectrophotometers.

Crystal City," "

Swan River: " "

CERTAIN METHODOLOGIES WERE CHANGED:

Glucose (manual); semi-automated Bilirubin, Phosphorous, Calcium and Acid Phosphatase.

Acetaminophen added to the menu at Killarney and Flin Flon. Semi-automated media pouring device installed at Flin Flon.

A new laboratory is scheduled to open at Reston, May/June 1984; at Gladstone late 1984 or early 1985. A renovated laboratory is operational at Glenboro.

New laboratory facilities are in various stages of planning for Neepawa, Flin Flon and The Pas.

Staff at Snow Lake and Lynn Lake have been upgraded so as to expand the scope of operations at these facilities.

LAXUS: RADIOLOGY - EASTERN REGION

CONTINUING PROGRAMS

The second phase of the five year project to introduce the Rare Earth Imaging System to rural Manitoba involved the eastern Units of Treherne, Morris, Steinbach, Teulon, and Selkirk. With the second phase complete, 70% of all patients radiographed in rural Manitoba will be with the new modality, which provides benefits of 50% reduction in radiation exposure, longer tube life and lower film costs.

The program to convert all X-Ray film identification printers to the Opti-Wedge system was completed in 1983. This device provides a constant multi-density image to each radiograph and enables the technologist to make a real time assessment of the functions of film processing, independent of the radiographic equipment.

The Division is pleased to welcome two additional radiologists to the Eastern Manitoba area. Dr. R. Diamond has accepted the appointment at the Selkirk Lab and X-Ray Unit. In addition to his duties at Selkirk, he is also providing visitation and interpretation for the Beausejour Lab and X-Ray Unit. Dr. A. Duncan moved to the Steinbach Lab and X-Ray Unit, providing a full service to the Steinbach community, as well as interpretation of examinations for the Vita Lab and X-Ray Unit.

NEW AND RENOVATED DEPARTMENTS

The Selkirk General Hospital held its grand opening in the spring of 1983. The Radiology Department includes three radiographic suites, darkroom, and ECG testing laboratory, a future Ultrasound location, a

conference area and various other offices and work areas.

The Arborg and District Health Centre moved into new facilities in the summer of 1983. The Radiology Department includes a general duty radiography room, darkroom, and shared office and waiting rooms with the laboratory.

The St. Claude Lab and X-Ray Unit was relocated to the lower level of the St. Claude Hospital in the fall of 1983.

The hospitals at Steinbach, Pine Falls, Gillam, Vita and Altona all have projects at the functional program level of planning and will involve new and/or renovated X-Ray Departments in the near future.

Renovations were completed at the Portage Lab and X-Ray Unit involving additional X-Ray file storage space. The Vita Lab and X-Ray Unit recently expanded the area within the X-Ray room. Stationary X-Ray control booths were installed at the Treherne and Emerson X-Ray Departments.

MAJOR CAPITAL EQUIPMENT PURCHASES

SELKIRK

A Picker GX 650 generator, an Astrol table with image amplification, and wall bucky, including automatic exposure control and automatic collimation were installed in the R/F suite.

A Picker GX 650 generator, with automatic exposure control and automatic collimation, a Clinex-R table and wall bucky were installed in the general radiography room.

ARBORG

New radiographic equipment was purchased for the new facility at Arborg. Included were a Picker GX 650 generator, a Clinex-R table and wall bucky, both with automatic exposure termination and automatic collimation plus an AFP 14 XL automatic film processor.

TREHERNE

A refurbished General Electric KXD 325 generator and an Aristocrat tabel with image amplication were installed at the Treherne Lab and X-Ray Unit.

MORRIS

The Xonics Petscope, a new concept in fluoroscopic imaging was installed at the Morris Lab and X-Ray Unit. This device utilizes a panel electronic tube as versed to the conventional IA tube and provides much better resolution, improved latitude, contrast and multi-directional viewing. The compact unit, only 4 inches high, is similar to the old style fluoroscopic screen and is mounted on the fluoro tower and requires no ceiling suspension. The images provided are real life size on a 9" diameter screen.

PINAWA

A new Xonics 350 RF two tube generator with high tension transformer was installed at Pinawa. The equipment, integrated with the existing Picker radiographic fluoroscopic equipment, utilizes the latest technology in micro-processed timer control.

WINKLER

A high film capacity Kodak M6AW film processor was installed at the Winkler Unit. The existing Pako 14 X2TCW film processor was re-installed at the Swan Lake Unit.

STEINBACH

A used Philips Du-205 C Arm with image amplification mobile radiographic unit was purchased for Steinbach to augment special O.R. procedures and radiographic studies. A General Electric Ordographic attachment was installed on the existing radiographic fluoroscopic equipment to expand the department's capabilities to tomographic examinations. Several mobile radiographic units were purchased for units throughout Manitoba and existing units were transferred elsewhere. The units involved were Teulon, Ste. Anne, The Pas, Flin Flon, and Arborg.

ELECTROCARDIOGRAPHY

In the spring of 1983 the Division elected to discontinue the Data Phone ECG transmission program. Over the 15 years of the program, 10's of 1000's of tracings were transmitted via telephone to a special receiving device at the Health Sciences Centre. The tracing was interpreted, microfilmed, and the report returned via TWX to the sending station. The advancing age of the equipment, the unavailability of replacement parts and the success of the program where local physicians undertook an ECG interpretation course sponsored by the College of Physicians and Surgeons of Manitoba, all played a part in the demise of the program.

During the past year, a Cambridge CM 3000 three channel ECG machine was purchased for the Selkirk Unit. With recent added peripherals the Department now provides a full ECG program including exercise stress testing.

A similar unit was purchased for the Portage Unit and their program will be upgraded to the same capacity.

Four single channel VS 550 Cambridge machines were purchased for the Selkirk, Portage, Interlake, and Southern Areas as part of the continuous upgrading program for ECG machine.

LAXUS: RADIOGRAPHY, ELECTROCARDIOGRAPHY & ULTRASONOGRAPHY - WESTERN REGION

RARE EARTH INTENSIFIER SCREENS

The second stage of the "Rare Earth" conversion was completed in February, 1984, with the introduction of Fuji G-8 gadoliniumoxysulfide intensifying screens into the Laboratory and X-Ray Services Radiography Departments in Deloraine, Virden, Hamiota, Minnedosa, Russell, Ste. Rose and Swan River.

To date a total of 17 out of 42 rooms in the region have been changed over to this system. It is hoped that an accelerated program will see a larger number of departments changed over next year.

ELECTROCARDIOGRAPHS

One Cambridge CM 3000 3 channel electrocardiograph was purchased and delivered to Neepawa late in the fiscal year.

Two Cambridge Vs 550 single channel electrocardiographs were purchased for Russell and Virden.

Both models are microprocessor controlled and have proven to be very dependable and produce high quality tracings.

Flin Flon received a new capacitor discharge type mobile X-Ray Unit while The Pas was upgraded with a 2 year old battery operated mobile transferred from another Unit.

Wawanesa became the newest addition to the Laboratory and X-Ray Services family when the Wawanesa Hospital and M.H.S.C. signed a Memorandum of Agreement for diagnostic services on April 20, 1983.

KILLARNEY

A new General Electric radiographic/fluoroscopic suite was installed in October, 1983. Instrumentation includes a single phase 300 mA at 150 kVp generator, closed circuit television system and a six inch image intensifier.

DAUPHIN

Received a new Kodak model M6A W and Ste. Rose received a new Kodak model M7B which are automatic film processors and replace worn and aged equipment.

Both are cold water processors with new energy conservation features that not only reduce operating costs but provide more stable processing conditions and consistent films.

NEW LOW VOLUME PROCESSOR

Brandon Mental Health Centre X-Ray Department field-trialed a new low-cost, low-volume, cold water film processor, appropriately called the ATL "Compact". It incorporates the latest in energy conservation features as well as a new simplified design, infra-red drying and chemistry temperature and level indicators.

The field trial proved the processor to be appropriate to our needs and three Untis were subsequently purchased and installed in B.M.H.C., McCreary, and Wawanesa departments.

LABORATORY MEDICINE EDUCATION

GENERAL:

Continued use was made of educational programs acquired from the Centre of Disease Control in Atlanta, Georgia. These programs consist of a text, visual slides, and an audio tape. Each program covers a specific topic related to laboratory medicine and may run up to one hour. The programs can be studied by individuals or in groups, at minimum cost to the Division, and at maximum convenience to the participants. During the year, 306 program utilizations were registered (one utilization = one person completing one program).

Dr. Williams, and invited specialists, continued the Division's onsite visitations. While at these visits, formal and informal presentations are delivered to rural physicians, technologists, auxiliary staff and the public. Fifty such visits were made over the year, presenting such topics as: AIDS; Hepatitis B Vaccine; Street Drugs; Poisoning; Medication for the Elderly; Child Abuse; and Parasites in Manitoba. The success of these programs is measured, in part, by the attendance and interest shown by the target groups. In all, 587 individuals attended: 223 physicians, 104 technologists, and 256 others. The Division is highly appreciative of the contributions made by the visiting specialists whose time and expertise made this program successful.

Three residents in Community Medicine received extensive training at the Cadham Provincial Laboratory; Drs. Johnson, Mirwaldt and Riordan.

A review was made of the library needs of the rural laboratories, and 21 volumes were subsequently added to our collection. Throughout previous sections of this annual report, mention is made of specific educational activities relating to particular sections or functions. These will not be listed here.

R.T. TRAINING:

The Cadham Provincial Laboratory continued its role in the training of candidates toward certification as Registered Technologists with the Canadian Society of Laboratory Technologists. Two categories of candidates are being trained:

- a) R.T. General Candidates: This program is run in conjunction with Red River Community College, where students received a 10-month didactic training, and the Grace General Hospital, where they receive the majority of a twelve month practical training. At the CPL, students receive a 12-week practical training in Clinical Microbiology. Four students participated in this program.

- b) R.T. Subject Candidates: These programs are specially designed in order to train selected candidates for a minimum of one year in a specific discipline as recognized by the Canadian Society of Laboratory Technologists.

Two CPL staff are engaged in such a program.

LABORATORY ASSISTANTSHIP TRAINING:

The Division continued to conduct a 12-week program to train selected Registered Radiological Technologists in the elementary practice of laboratory medicine. In this program candidates receive six weeks intensive didactic training at the Cadham Provincial Laboratory, followed by six weeks of guided practice in one of our rural Units. Two classes were conducted; 12 candidates graduated.

INSERVICE TRAINING:

This area of training is categorized in five distinct formats:

- 1) Simple rundowns on routine procedures by on-line staff, particularly to new staff and to summer students.
- 2) Introduction of new tests or instruments. This may involve:
 - a) Familiarization by a sales representative or a senior staff member.
 - b) A pre-test as a guide to basic relevant knowledge.
 - c) Practice under supervision and guidance, and with explanation by an instructor.
 - d) A practical test to demonstrate competence in all procedural aspects.
 - e) A post-test to demonstrate an understanding of principles, applications and pitfalls.
- 3) Topical lectures by senior staff or invited guests.
- 4) Short programs that are sent to individuals or groups, and that can be learned on-site without help from an Instructor.
- 5) Formal programs that require indepth involvement and longer time commitments from both the participant and an Instructor- e.g., re-training of staff in disciplines they may not have had any experience in for a number of years. Another such program is a correspondence course in urinalysis developed and administered by the Co-ordinator. That course provided 28 lessons to 11 individuals.

Specific activities under categories 2, 3, and 4 are listed below. The numbers in brackets represent the number of staff in attendance at the respective session:

Supervisory Skills (DTB) corr.	Various Places	30 hours	(6)
Performance Appraisal Seminar	Winnipeg	1 day	(7)
Stroke Related Films	Dauphin	1?hours	(15)
Monoclonal Antibodies	Dauphin	1 hour	(10)
Fire Safety Workshop	Dauphin	3	(2)
Therapeutic Drug Monitoring	Dauphin	1?hours	(7)
Stress Management Seminar	Winnipeg	1 day	(16)
	Portage	1 day	(7)
Virology and Serology Topic (WS)	CPL	12 hours	(15)
Miscellaneous Films	Swan River	1?hours	(6)
	Flin Flon	2?hours	(7)
Blood Gas Seminar	Killarney	4 hours	(6)
	Winnipeg	1 day	(1)
Safety Isn't It Worth It	CPL	1 hour	(53)
Clinical Microbiology Update	CPL	1-3 weeks	(4)
Safety Seminar	CPL	2 hours	(29)
MHSC, The Province and LAXUS	Morden	?	(22)
Cancer in the Workplace	CPL	1 hour	(40)

EXTRAMURAL TRAINING:

Several staff members received assistance to partake in extramural training programs, or supported themselves in such activities:

Microbiology Update (SAIT) corr	Portage	60 hrs.	(2)
Instrumentation (NAIT) corr	Portage	30 hrs.	(2)
Winnipeg Academy Seminars	Winnipeg	4 hrs.	(28)
Coulter Countdown Course	Vancouver	2 days	(1)
MB Assoc. Cardiology Tech. Seminar	Winnipeg	4 hrs.	(3)
Adv. Red Cell Disorders (CSLT) corr	Swan Lake	60 hrs.	(20)
Immunohematology update (SAIT) corr	Hamiota	60 hrs.	(1)
Immunohematology update (CRC)	Lynn Lake	2 days	(1)
Blood Morphology update (HSC)	Winkler	2 days	(1)
Cost Effective Laboratories	Edmonton	2 days	(1)
Biohazard Seminar (U of M)	Winnipeg	1 hrs.	(8)
Computer Assisted Education (RRCC)	Winnipeg	120 hrs.	(1)
A.S.M. Convention	St. Louis, MO	5 days	(1)
Clinical Microbiology (TMIT) corr	Dauphin	60 hrs.	(1)
Can. Hosp. Inf. Control Assoc.	Winnipeg	3 days	(2)
Hospital Dep. Management (CHA) corr	Killarney	60 hrs.	(1)
	Dauphin	60 hrs.	()
Quality Assurance	Winnipeg	2 days	(2)
Competence Assurance (CSLT) telenar	Dauphin	1 hr.	(7)
Clinical Relevance of Microbiology	Dauphin	8 hrs.	(11)
Parkland Academy Seminars	Dauphin	5 hrs.	(13)
Heart Disease Seminar	Dauphin	4 hrs.	(16)
Analysis of Amino Acids (CSLT)	Flin Flon	6 hrs.	(1)
Arbovirus Techniques (US Dept. of Health)	Fort Collins	1 wk.	(1)
National Congress (CSLT)	Halifax	4 days	(5)
Advanced Hematology (BCIT) corr	Gimli	60 hrs.	(1)
Lab Management (CSLT) corr	Killarney	60 hrs.	(1)
Brandon Academy Seminars	Brandon	1 day	(6)
Can. Public Health Conference	Montreal	4 days	(1)
1st Can. Conf. Q.C. in Microbiology	Toronto	2 days	(1)
CPR Course	Selkirk	1 day	(12)
Modern Blood Group Serology (CSLT) corr	Swan River	60 hrs.	(1)
Agasis Academy Seminar	Portage	4 hrs.	(11)
Human-Animal Related Diseases	Portage	1 hr.	(7)

LEGEND:

SAIT	-	Southern Alberta Institute of Technology, Calgary
NAIT	-	Northern Alberta Institute of Technology, Edmonton
CSLT	-	Canadian Society of Laboratory Technologists, Hamilton
TMIT	-	Toronto Institute of Medical Technology
DTB	-	Department of Training & Development, Man. Government - Winnipeg
ASM	-	American Society of Microbiology
CHA	-	Canadian Hospital Association
CRC	-	Canadian Red Cross Blood Transfusion Lab. - Winnipeg
RRCC	-	Red River Community College - Winnipeg
corr	-	Correspondence Course
HSC	-	Health Sciences Center - Winnipeg

A number of our staff continued to contribute a significant amount of their time to teaching at the University of Manitoba Medical and Dental Faculties. These activities include lectures, seminars, tutorials, rounds and laboratory sessions in a variety of health-related programs. Two post-graduate medical courses are conducted entirely by CPL staff:

Clinical Parasitology - Co-ordinator - Dr. L. Sekla

Clinical Virology - Co-ordinator - Dr. G. Hammond

Many other presentations are delivered to outside groups. Some of the more noteworthy are:

Delaat, A.N.C.
Biosafety and the Clinical Laboratory
National Congress, C.S.L.T., Halifax, 1983.

Delaat, A.N.C.
Functions and Objectives of the CPL
Deer Lodge and St. Boniface Hospital student technologists - 1983-84

Fox, Dr. J.G.
Alpha fetoprotein progress report on a Manitoba pilot program
Department of Health personnel, Manitoba Government
Executive staff, M.H.S.C.
Community Medicine Residents, U. of M.
Medical Consultants and Standards Officers, M.H.S.C.

Gade, K. and Jones, N.
Blood Grouping, RH and Crossmatching
Swan River Valley Hospital and Care Home Staff, 1983.

Hammond, Dr. G.W.
Control of Nosocomial Respiratory Virus Infections
Annual Convention, Canadian Hospital Infection Control Association, Winnipeg - 1983.

Hammond, Dr. G.W.
Hepatitis B and Its Prevention
19th Annual Meeting, Canadian Academy of Endodontics, Winnipeg, 1983.

Hammond, Dr. G.W.
Influenza Viruses
Manitoba Branch, C.S.L.T., Winnipeg, 1984.

Hammond, Dr. G.W.
Neonatal Enterovirus Infections-Manitoba Experience; Noon Rounds, Winnipeg,
Adenovirus Gastroenteritis; Pediatric Grand Rounds, Winnipeg
An Erythema-Infectiosum-like Illness Caused by Human Parvovirus - Winnipeg
Experience; Noon Rounds, Winnipeg.

Moore, L. and Lewis R.
Requisitioning for the Laboratory
Bethel Nursing Home Staff, Gimli, 1983.

Otchenash, Wm.
Procurement and Handling of Specimens
St. Anthony's Hospital Nursing Staff, The Pas, 1983.

Robbins, D.
Blood Banking and Hematology
St. John's Ambulance Chapter, Selkirk, 1983.

Sekla, L.
The Laboratory Diagnosis of Arboviruses - Manitoba Experience
Canadian Public Health Association Conference, Montreal, 1983.

Sekla, L.
Legionnaires bacilli, Post Seminar Medical Microbiology
Arbovirus Virology, Post Graduate Course, Entomology
Clinical Parasitology Post Graduate Course, Nursing
University of Manitoba, 1983.

Sekla, L.
Parasitology Infection Control for Rural Hospitals
Manitoba Health Services Commission, Winnipeg, 1983.

Sekla, L.
Laboratory Diagnosis of Malaria
Victoria Hospital Staff, Winnipeg, 1983.

Sekla, L.
Hepatic Risk in Maternal Wards
Obstetric and Gynecology Nurses, Winnipeg, 1983.

Skerry, I.
Clinical Microbiology
St. Paul's Residence Staff, The Pas, 1983.

Stackiw, W.
Western Equine Encephalitis in Manitoba
Manitoba Branch, C.S.L.T., Winnipeg, 1984.

Stackiw, W.
Water Microbiology and Testing
Waste and Waterworks School, Winnipeg, 1984.

Stackiw, W.
Clinical Virology
Med. Lab. Technology Students, Red River Community College, 1983.

Stackiw, W.
Environmental Microbiology
Mines Inspectors Seminar, Winnipeg, 1984.

Thompson, R.
Metabolic Screening
Clinical Chemistry CE Group, Health Sciences Centre, Winnipeg, 1983.

Williams, Dr. T.W.
Hepatitis and AIDS
Winnipeg Dental Group, Winnipeg, 1983.

Wilt, Dr. J.C.
The First Century of Microbiology and Infectious Diseases in Manitoba
Canadian Society of Microbiology, Annual Meeting, Winnipeg, 1983.

Yaschyshyn, M. and Bourgeault, D.
Collection of Laboratory Specimens
Swan River Valley Hospital Staff, Swan River, 1983.

VOCATIONAL GUIDANCE:

Various staff members participated in career day activities at a number of highschools throughout the Province and at Regional Career Symposia, Morden, Winnipeg, Dauphin, Selkirk, Portage, Stonewall. Career guidance was also provided to various staff members, summer students, and several requestees.

Dr. A. Maniar was a judge at the Annual School Science Fair and Symposium finals in Winnipeg.

PUBLICATIONS:

1. Balfour, H.H., et al. Acyclovir Halts Progression of Herpes Zoster in Immunocompromised patients. New England Journal of Medicine, 24:1448-1453, 1983.
2. Hammond, G.W. Laboratory Diagnosis of Viral Sexually Transmitted Diseases. Canadian Journal of Public Health. 74:159-163, 1983.
3. Hammond, G.W. Viral Infections of the Central Nervous System. Medicine NA, 5:443-447, 1983.
4. Hammond, G.W., Ahluwalia, G.S., Klisko, B., and Hazelton, P.R. Human Rotavirus Detection by Counterimmunoelectrophoresis Versus Enzyme Immunoassay and Electron Microscopy after Direct Ultracentrifugations. Journal of Clinical Microbiology, 19:439-441, 1984.
5. Kordova, N., Wilt, J.C., Sekla, L., Stackiw, W., Feltham, S., Postl, B., and Nicole, L. High Prevalence of Antibodies to Chlamydia trachomatis in a Northern Canadian Community. Canadian Journal of Public Health. 74:246-249, 1984.
6. Kordova, N., Wilt, J.C., Sekla, L., Hannan, C., William, T., Stackiw, W., Herchl, R., Feltham, S. Prevalence of Antibodies to Chlamydia trachomatis in Health Population Groups in Manitoba. Canadian Medical Association Journal, 129:1111-1117, 1983.
7. Mabon, J. Gardnerella Vaginalis: A Review. Canadian Society of Laboratory Technologists. Hamilton, Ontario, 1983.

8. Maniar, A.C., Chub, H., Louie, T.J., Williams, T.W., Forsythe, W., and Wilt, J.C. Comparison of McCoy vs Hela Cells for the Detection of Clostridium Difficile Toxin. Journal of Clinical Microbiology. 19:294-295, 1984.
9. Phippen, D. Infection Control. Allied Medical Education News. 6:10, 1984.
10. Wallis, P., and Lehman, D., Editors: Biological Health Risks of Sludge Disposal to Land in Cold Climates. University of Calgary Press. Calgary, 1983.
 - a) Sekla, L., Lehman, D., and Wallis, P. Parasites and the Land Application of Sewage: A Literature Review and an Assessment of the Health Risk in Canada. pp.213-214.
 - b) Sekla, L., Wallis, P., and Lehman, D. Summary of the Parasitological Aspects of the Land Disposal of Sludge. pp. 241-247.
 - c) Sekla, L., and Stackiw, W. Land Disposal of Municipal Sludge and Effluent: Two Microbiological Studies. pp. 337-367.
11. White, G. Centrifuchem System 600. Divisional Newsletter, 1983.

ABSTRACTS:

1. Diaz-Mitoma, F., Harding, G.K.M., Hammond, G.W., Hoban, D.J., MacFarlane, N., Malazdrewicz, R., Low, D.E. Ventriculo Peritoneal Shunt (VPS) Infections Due to Coagulase Negative Staphylococci. 23rd Inter-science Conference on Antimicrobial Agents and Chemotherapy, Las Vegas, Nevada. October 25, 1983.
2. Hammond, G.W., Thompson, L., Lukes, H., Mauthe, G., Williams, T.W., Moodie, P. The Clinical Epidemiological and Laboratory Spectrum of Adenovirus Gastroenteritis. 23rd Inter-science Conference on Antimicrobial Agents and Chemotherapy, Las Vegas, Nevada. October 26, 1983.
3. Hammond, G.W., Lukes, H., Thompson, L., Mauthe, G., Duncan, V., Young, L., Hannan, C., Moodie, P., and Williams, T.W. Prospective Family Study of Adenovirus Gastroenteritis. 51st Conjoint Meeting on Infectious Diseases, Montreal, Quebec. December 1, 1983.
4. Hammond, G.W., Mauthe, G., Lukes, H., Joshua, J., Hannan, C. Application of Restriction Endonuclease Analysis of Adenovirus DNA for Identification of Adenovirus Strains. 51st Conjoint Meeting on Infectious Diseases, Montreal, Quebec. November 30, 1983.

5. Hammond, G.W., Hoban, D.J., Witwicki, E. Bacteria Antigen Detection in Cerebrospinal Fluid. 51st Conjoint Meeting on Infectious Diseases. Montreal, Quebec. November 30, 1983.
6. Hazelton, P.R., and Hammond, G.W. Negative Stains for Electron Microscopic Detection of Small Round Enteric Viruses from Human Fecal Specimens. 33rd Canadian Society of Microbiologists Meeting, Winnipeg, Manitoba. June 19-23, 1983.
7. Low, D.E., Harding, G.K., Kaplan, J., Kinney, J., McKray, E., Riben, P., Davi, M., Kovnats, S., Hammond, G.W. Viral Outbreak in a Newborn Nursery Unit. 51st Conjoint Meeting on Infectious Diseases. Montreal, Quebec. December 1, 1983.

LABORATORY SAFETY

The Divisional Safety Officer continued his monitoring and review of laboratory safety practices and standards throughout the Division. During the year, 20 facilities were inspected, and several consultations were offered. Spill control cushions were introduced to all laboratories.

A formal Workplace Safety and Health Committee was established at the Cadham Provincial Laboratory comprised of R. Massey, M.W. Burroughs, P. Pugh, and G. Eibisch.

EDUCATION - RADIOLOGY

R.T. Training

The Manitoba Health Services Commission X-Ray Training School continued its program of training candidates for Registration with the Canadian Association of Medical Radiation Technologists. The program involves 25 months of x-ray training plus three months of Laboratory Assistant Training.

During the 1983/84 fiscal year there were four successful candidates of the registration examination. There were also five candidates who were successful in passing the theoretical phase of their training at Red River Community College and are presently undergoing their initial phase of practical training in the Class "A" rural Units. Another six students are presently enrolled in the second year of their program. During the month of March they complete their affiliation in a City hospital. This will be followed by four weeks at Red River Community College and the program will then be completed by a five month period in the rural "C" Units.

In the fall of 1983 the training program underwent an intensive review by the Conjoint committee on accreditation of training programs. This consisted of two days of interviews of students, graduates, instructors and administrative personnel carried out by an out-of-province team of Radiologists and Technologists. At the conclusion of the survey, many favorable comments on the program were made by the team, and the program received full accreditation for a five year term. Several recommendations were made by the team, mostly involving the program change due to be implemented in the fall of 1984.

The Medical Directorship of the training program changed hands in March of 1984. After six years of serving in this capacity, Dr. D.R. Dyck of the Southern Region decided to turn the responsibilities of this position over to someone new. The Training School wishes to express gratitude to Dr. Dyck for his assistance and advice during his term. The excellent relationship was very much appreciation.

At the same time, we wish to welcome Dr. Robert Diamond of Selkirk as the new Medical Director and look forward to a continuing of the previous beneficial relationship.

X-RAY ASSISTANT TRAINING

The Provincial Laboratory and X-Ray Unit Systems sponsored selected Registered Medical Laboratory Technologists in a four month X-Ray Assistant Course designed to train these individuals to assist Radiological Technologists in the covering of emergency call-backs. The course graduated nine of these individuals in 1983 and another six have commenced training in early 1984.

REINSTATEMENT

Technologists who have been inactive in the field of X-Ray Technology for a period exceeding five years, must undergo a re-training program in order to be eligible for reinstatement with the Manitoba Association of Medical Radiation Technologists. The program is a minimum of 8 weeks and consists of a combination of on-site clinical experience and a self-study audiovisual program. This year, one individual was re-instated.

INSERVICE TRAINING

A number of In-service seminars and workshops were organized and delivered by the Regional Supervisors, District Radiologists, Area Chief Technologists, staff technologists and the Technical Instructor. The following topics were covered at the respective locations with the figures in brackets representing the number of individuals attending:

1. Rare Earth In-service:

Morris	2 hours	(4)
Selkirk	2 hours	(6)
Steinbach	2 hours	(2)
Teulon	2 hours	(2)
Hamiota	2 hours	(5)
Neepawa	2 hours	(4)
Swan River	2 hours	(4)
Deloraine	2 hours	(2)

2. Southern Area In-service Sessions:

Winkler - Bone Tumors	2 hours	(10)
Morden - Small bowel Radiology	2 hours	(9)
Carman - Cervical Spine	2 hours	(12)
Winkler - Biliary System	3 hours	(19)

3. Swan River Area In-service Sessions:

I.V.P.	1 hour	(15)
Tomography	1 hour	(15)
Gall Bladder Visualization	1 hour	(15)
Barium Series	1 hour	(15)

4. Dauphin Area In-service Sessions:

Quality Assurance	2½ hours	(6)
Heart Disease	4 hours	(16)
Computerized Tomography	1 hour	(9)
3 films from Heart Foundation	2 hours	(15)

5. Selkirk In-service:

Film critique	1 hour	(9)
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6. Supervisory Skills 8 hours (16)

7. Stress Management 8 hours (16)

8. The Computer in LAXUS 1 hour (12)

9. Slide/Tape Programs:

a. "Radiography of the Immobile Trauma Patient"

7 hours (approx.)	(2)	Pinawa
	(3)	Gimli
	(1)	Whitemouth

b. "Aspects of Radiography"

5 hours (approx.)	(3)	The Pas
	(2)	Stonewall

EXTRAMURAL TRAINING:

Several staff members were assisted or otherwise participated in external training programs:

1. C/MRT Instructors Seminar, Toronto	2 days	(1)
Continuing Education, Toronto	5 days	(1)

2. MAMRT Continuing Education

a. Portage La Prairie - Nuclear Magnetic Resonance	2 hours	(2)
- Transluminal Angioplasty	2 hours	(2)
- Handling Stress	2 hours	(2)
b. Winnipeg - Anatomy and Physiology	36 hours	(4)
c. Brandon - Anatomy and Physiology	36 hours	(3)

3. Several technologists have undertaken self-study programs and/or correspondence courses to improve their knowledge in the field. The topics range through electrocardiography, pathology and cross-sectional anatomy. Most of these programs result in the individuals receiving credits towards advanced certification with their National Professional Organization. These individuals are to be commended for their initiative and self-motivation.

TABLE I

LABORATORY & X-RAY SERVICES DIVISION
 WORKLOAD-STATISTICS CANADA UNITS
 APRIL 1/83 - MARCH 31/84
 WITH COMPARISON TO 82/83

RURAL LABORATORY & X-RAY UNITS	1982/83			1983/84		
	No. of EKG's	No. of X-Ray Ex.	Statistics Canada Units	No. of EKG's	No. of X-Ray Ex.	Statistics Canada Units
Russell Area	2,684	7,292	641,345	2,505	7,059	684,027
Dauphin Area	10,335	30,943	2,197,649	10,054	29,502	2,438,977
Neepawa Area	3,884	13,779	1,149,449	4,278	15,184	1,251,975
Portage Area	4,381	17,049	1,309,873	4,738	17,301	1,461,091
Killarney Area	3,752	14,866	1,075,226	4,562	15,504	1,283,459
Morden Area	6,456	24,990	2,274,224	6,738	25,591	2,332,664
Selkirk Area	5,144	22,203	1,387,767	5,726	23,521	1,511,007
Swan River Area	2,668	9,109	717,105	2,746	9,685	749,764
Gimli Area	2,764	12,066	865,456	2,963	11,671	863,581
Virden Area	4,952	15,242	1,246,654	4,328	14,240	1,239,221
Special Agreement Units	11,7733	55,666	4,324,264	12,669	59,013	4,488,200
TOTAL RURAL	58,753	223,205	17,189,012	61,307	228,276	18,303,966

CADHAM PROVINCIAL LABORATORY	No. of Spec.s	No. of Tests	Statistics Canada Units	No. of Spec.s	No. of Tests	Statistics Canada Units
Clinical Microbiology	85,400	93,154	2,411,973	77,639		1,511,486
Media			278,973			318,985
Virus Isolation	12,007	15,750	2,062,648	14,195	15,032	1,907,940
Environmental Microbiology	46,155	87,436	1,725,916	54,307	96,954	2,315,386
Serology	133,876	307,224	4,224,294	125,159	289,356	4,155,614
Metabolic Diseases	32,146	169,876	638,224	33,310	164,488	682,525
Chemistry	4,692	9,015	47,021	7,878	15,232	83,678
TOTAL CPL	314,276	682,455	11,388,634	312,488		10,975,614
S.C. UNITS LAB. & X-RAY SERVICES DIVISION			28,577,646			29,279,580

TABLE II

CADHAM PROVINCIAL LABORATORY
Workload in Stats Canada Units
By Laboratory Section

April 1/83 - March 31/84
With Comparison to 82/83

	1982/83		1983/84	
	Number of Specimens	Stats Canada Units	Number of Specimens	Stats Canada Units
Clinical Microbiology	85,400	2,411,973	77,639	1,511,486
Media	-	278,558	-	318,985
Virus Isolation	12,007	2,062,648	14,195	1,907,940
Environmental Microbiology	46,155	1,725,916	54,307	2,315,386
Serology / Parasitology	133,876	4,224,294	125,159	4,155,614
Metabolic Diseases	32,146	638,224	33,310	682,525
Chemistry	4,692	47,021	7,878	83,678
TOTAL	314,276	11,388,634	312,488	10,975,614

RURAL LAB & X-RAY SERVICES UNITS-APRIL 1st, 1983 to MARCH 31st, 1984

UNIT	X-RAY EXAMINATIONS			X-RAY S.C. UNITS			LAB S.C. UNITS			E.C.G.'S		
	TOTAL	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT
RUSSELL	2,917	699	2,218	113,881	34,042	79,839	206,638	87,699	118,939	843	355	488
BIRK	2,108	265	1,843	64,957	10,447	54,510	256,498	66,724	189,774	964	317	647
ROSSBURN	918	203	715	24,498	6,211	18,287	81,122	29,235	51,887	315	143	172
SNOW LAKE	1,116	263	853	30,433	7,864	22,569	139,769	47,821	91,948	383	189	194
DAUPHIN	16,667	4,165	12,502	662,923	178,219	484,704	1,340,353	467,941	872,412	6,208	2,104	4,104
GILBERT PLAINS	1,347	214	1,133	38,271	7,863	30,408	71,284	18,513	52,771	363	100	263
GRANDVIEW	1,339	188	1,151	35,173	6,317	29,656	93,950	30,254	63,696	311	85	226
MOOREHEAD	1,273	297	976	35,056	8,925	26,131	100,886	40,656	60,230	628	202	426
ROBLIN	2,992	686	2,306	86,216	23,748	62,468	421,498	136,634	284,864	1,110	611	499
STE. ROSE	4,653	1,529	3,124	136,727	49,631	87,096	294,252	207,638	86,614	877	701	176
WINNIPEGOSIS	1,231	520	711	33,690	15,512	18,178	116,754	73,865	42,889	557	341	216
NEEPAWA	5,872	1,157	4,715	201,596	40,489	161,107	524,431	179,263	345,168	1,792	696	1,096
CARBERRY	2,238	452	1,786	65,025	13,162	51,863	209,674	68,306	141,368	784	191	593
ERICKSON	637	161	476	18,482	6,250	12,232	69,544	27,981	41,563	149	43	106
GLADSTONE	2,712	629	2,083	94,366	24,301	70,065	248,400	79,798	168,602	574	204	370
MINNECOTA	3,725	762	2,963	125,766	25,908	99,858	199,926	87,578	112,348	979	421	558
PORTAGE	13,082	3,025	10,057	456,980	117,634	339,346	1,105,014	364,584	740,430	3,588	1,358	2,230
MACGREGOR	617	194	423	17,398	6,964	10,434	36,891	25,375	11,516	324	142	182
MANITOBA SCHOOL	955	955	-	29,097	29,097	-	82,392	-	82,392	145	-	145
NOTRE DAME	484	136	348	14,185	4,985	9,200	50,688	10,839	39,849	130	68	62
ST. CLAUDE	565	183	382	16,598	6,931	9,667	56,742	26,954	29,788	248	109	139
TREHERNE	1,598	208	1,390	60,805	9,575	51,230	129,364	46,615	82,749	303	119	184
KILARNEY	4,795	973	3,822	158,489	35,424	123,065	343,013	118,938	224,075	921	374	547
BALDUR	560	147	413	16,799	6,087	10,712	54,817	27,538	27,279	174	102	72
BOISSEvain	2,249	491	1,758	64,124	16,587	47,537	196,704	63,090	133,614	889	350	539
CARTWRIGHT	221	36	185	5,814	1,203	4,611	16,942	4,004	12,938	53	5	48
CRYSTAL CITY	2,755	655	2,100	79,763	22,142	57,621	269,922	106,190	163,732	1,005	529	476
DELORAIN	2,849	439	2,410	94,062	17,562	76,500	228,662	88,533	140,129	679	266	413
MELITA	2,075	362	1,713	57,127	13,840	43,287	173,399	59,956	113,443	841	334	507
MORDEN	5,236	1,500	3,736	186,640	55,530	131,110	564,363	216,562	347,801	1,186	640	546
ALTONA	3,281	595	2,685	108,545	19,551	88,994	216,687	71,967	144,720	593	197	396
CARMAN	3,885	1,218	2,667	134,422	46,220	88,202	304,282	128,540	175,742	804	405	399
EMERSON	962	227	735	24,806	5,927	18,879	96,209	33,004	63,205	372	92	280
MANITOU	605	111	494	15,572	3,665	11,907	40,057	12,338	27,719	268	86	182
MORRIS	2,653	582	2,071	80,206	17,822	62,384	347,416	121,811	225,605	1,196	524	672
SWAN LAKE	4,120	624	3,496	146,580	28,946	117,634	394,312	99,946	294,366	1,258	263	995
WINKLER	4,850	1,718	3,132	220,537	72,525	148,012	369,338	214,509	154,829	1,061	864	197
SELKIRK	11,747	1,841	9,906	392,779	65,003	327,776	784,067	266,197	517,870	2,864	1,048	1,816
BEAUFORT	4,396	742	3,654	154,447	30,826	123,621	193,441	132,200	61,241	578	475	103
LAC DU BONNET	902	-	902	22,824	-	22,824	64,604	-	64,604	376	-	376
PINAWA	1,575	332	1,243	55,682	13,314	42,368	153,536	52,494	101,042	541	388	153
PINE FALLS	3,372	976	2,396	95,075	28,085	66,990	283,850	137,069	146,781	1,122	548	574
SELKIRK H. H. C.	949	949	-	30,244	30,244	-	-	-	-	-	-	-
WHITTEMOUTH	580	245	335	17,384	8,976	8,408	31,509	17,361	14,148	245	116	129
SWAN RIVER	9,428	2,168	7,260	306,336	67,465	238,871	725,315	295,455	429,860	2,624	1,088	1,536
BENITO	257	51	206	7,790	1,722	6,068	24,449	6,357	18,092	122	33	89
GIMLI	3,153	565	2,588	109,515	26,732	82,783	269,152	71,583	197,569	1,098	329	769
ERIKSDALE	1,384	211	1,173	35,190	7,569	27,621	63,723	26,577	37,146	173	93	80
RIVERTON	164	-	164	3,756	-	3,756	-	-	-	-	-	-
STONEWALL	3,119	507	2,612	85,648	17,667	67,981	238,501	67,503	170,998	875	265	610
TEulon	3,851	728	3,123	121,747	24,914	96,833	292,205	102,517	189,688	817	301	516
VIRIDEN	4,182	704	3,478	137,776	27,877	109,899	331,930	95,808	236,122	1,314	410	904
BRANDON M.H. C.	1,497	1,118	379	36,452	27,356	9,096	-	-	-	-	-	-
HAMILTON	2,497	460	2,037	77,456	14,660	62,796	344,017	107,888	236,129	1,017	355	662
RESTON	347	75	272	10,239	2,946	7,293	31,270	11,375	19,895	136	60	76
RIVERS	1,268	180	1,088	33,770	5,206	28,564	138,634	30,744	107,890	479	72	407
SOURIS	4,449	1,048	3,401	148,559	37,891	110,668	393,370	161,660	231,710	1,382	443	939
ARBURG	2,975	588	2,387	68,842	16,875	51,967	148,384	79,202	69,182	427	332	95
ASHERN	1,551	224	1,327	40,587	6,969	33,618	113,812	29,988	83,824	445	105	340
CHURCHILL	1,787	546	1,241	58,580	20,522	38,058	494,321	184,804	309,517	498	242	256
FLIN FLON	14,452	3,629	10,823	432,026	111,817	320,209	1,021,125	481,627	539,498	4,424	1,712	2,712
GILLAM	876	153	723	22,698	5,351	17,347	75,300	19,464	55,836	150	62	88
GLENBORO	320	72	248	8,815	2,525	6,290	43,712	14,359	29,353	258	114	144
LEAF RAPIDS	922	59	863	27,317	2,045	25,272	77,351	6,915	70,436	20	8	12
LYNN LAKE	1,272	306	966	43,406	12,373	31,033	110,717	50,334	60,383	200	85	115
ST. PIERRE	3,474	715	2,759	135,942	34,158	101,784	152,587	66,718	85,869	684	363	321
STE. ANNE	4,360	756	3,604	149,506	26,676	122,830	148,109	83,622	64,487	569	368	201
SNOW LAKE	735	14	721	18,073	213	17,860	54,117	3,257	50,860	112	14	98
STEINBACH	7,832	1,652	6,180	297,973	65,533	232,440	635,072	259,329	375,743	2,330	932	1,398
THE PAS	16,957	4,420	12,537	571,977	141,808	430,169	1,307,885	717,940	589,945	1,990	1,172	818
VITA	593	111	482	16,369	3,352	13,017	36,712	14,463	22,249	183	79	104
WAWANESA	912	170	742	26,008	4,975	21,033	68,996	10,863	58,133	379	79	300

TOTAL LAB S. C. UNITS - 18,303,966 IN/PAT - 7,096,872 OUT/PAT - 11,207,084
 TOTAL X-RAY EXAMINATIONS - 228,277 IN/PAT - 52,885 OUT/PAT - 175,392
 TOTAL X-RAY S. C. UNITS - 7,567,297 IN/PAT - 1,890,751 OUT/PAT - 5,676,546
 TOTAL E.C.G. EXAMINATIONS - 61,307 IN/PAT - 25,221 OUT/PAT - 36,086

TABLE IV

RURAL LABORATORY AND X-RAY UNITS
 LABORATORY STATISTICS CANADA UNITS BY AREA
 1982/83 - 1983/84

LABORATORY S.C.U.'S	1982/83			1983/84		
	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT	TOTAL
UNITS						
RUSSELL	236,304	405,041	641,305	231,479	452,548	684,027
DAUPHIN	946,342	1,251,307	2,197,649	975,501	1,463,476	2,438,977
NEEPAWA	421,872	727,577	1,149,449	442,926	809,049	1,251,975
PORTAGE	431,681	877,922	1,309,603	474,367	986,724	1,461,091
KILLARNEY	380,846	694,380	1,075,226	468,249	815,210	1,283,459
MORDEN	888,152	1,386,072	2,274,224	898,677	1,433,987	2,332,664
SELKIRK	591,845	795,922	1,387,767	605,321	905,686	1,511,007
SWAN RIVER	312,110	404,995	717,105	301,812	447,952	749,764
GIMLI	256,827	608,629	865,456	268,180	595,401	863,581
VIRDEN	432,747	813,907	1,246,654	407,475	831,746	1,239,221
SPECIAL AGREE- MENT UNITS	1,968,789	2,355,475	4,324,264	2,022,885	2,465,315	4,488,200
TOTALS	6,867,515	10,321,227	17,188,702	7,096,872	11,207,094	18,303,966

TABLE V
RURAL LABORATORY AND X-RAY UNITS
ELECTROCARDIOGRAPH TRACINGS BY AREA
1982/83 - 1983/84

E.C.G.'S	1982/83			1983/84		
	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT	TOTAL
UNITS						
RUSSELL	1,168	1,516	2,684	1,004	1,501	2,505
DAUPHIN	4,016	6,319	10,335	4,144	5,910	10,054
NEEPAWA	1,473	2,411	3,884	1,555	2,723	4,278
PORTAGE	1,583	2,798	4,381	1,796	2,942	4,738
KILLARNEY	1,563	2,189	3,752	1,960	2,602	4,562
MORDEN	3,051	3,405	6,456	3,071	3,667	6,738
SELKIRK	3,038	2,106	5,144	2,575	3,151	5,726
SWAN RIVER	961	1,707	2,668	1,121	1,625	2,746
GIMLI	1,014	1,750	2,764	988	1,975	2,963
VIRDEN	1,639	3,313	4,952	1,340	2,988	4,328
SPECIAL AGREE- MENT UNITS	5,297	6,436	11,577	5,667	7,002	12,669
TOTALS	24,803	33,950	58,753	25,221	36,086	61,307

TABLE VI

RURAL LABORATORY AND X-RAY UNITS
X-RAY EXAMINATIONS BY AREA
1982/83 - 1983/84

X-RAY EXAMINATIONS	1982/83			1983/84		
	IN/PAT	O/PAT	TOTAL	IN/PAT	O/PAT	TOTAL
UNITS						
RUSSELL	1,782	5,510	7,292	1,430	5,629	7,059
DAUPHIN	8,513	22,430	30,943	7,599	21,903	29,502
NEEPAWA	3,004	10,775	13,779	3,161	12,023	15,184
PORTAGE	4,743	12,306	17,049	4,701	12,600	17,301
KILLARNEY	2,837	12,029	14,866	3,103	12,401	15,504
MORDEN	7,017	17,973	24,990	6,575	19,016	25,591
SELKIRK	4,999	17,204	22,203	5,085	18,436	23,521
SWAN RIVER	2,081	7,028	9,109	2,219	7,466	9,685
GIMLI	2,009	10,057	12,066	2,011	9,660	11,671
VIRDEN	3,990	11,252	15,242	3,585	10,655	14,240
SPECIAL AGREE- MENT UNITS	12,960	42,706	55,666	13,415	45,603	59,018
TOTALS	53,935	169,270	223,205	52,884	175,392	228,276

TABLE VII

LABORATORY & X-RAY SERVICES DIVISION
ULTRASOUND STATISTICS
1983/84

UNIT	TOTAL	IN-PATIENT	OUT-PATIENT
WINKLER	1,808	151	1,657
DAUPHIN	2,221	247	1,974
SWAN RIVER	260	51	209
THE PAS	1,482	304	1,178

TABLE VIII

CLINICAL MICROBIOLOGY ISOLATES

April 1/83 - March 31/84

With Comparison to 1982/83

		<u>NUMBER OF ISOLATES</u>	
		1982/83	1983/84
A. <u>RESPIRATORY SECTION</u>			
C. diphtheriae:			
gravis toxigenic	78		67
gravis non-toxigenic	26		21
mitis toxigenic	1		2
mitis non-toxigenic	82		116
intermedius toxigenic	3		0
intermedius non-toxigenic	3		0
Bordetella pertussis	4		8
Acid Fast Bacilli			
positive culture	112		67
positive smears	12		22
Legionella:			
L. pneumophila	0		1
L. bozemanii sero. 1	0		1
L. jordanis	0		1
B. <u>MYCOLOGY SECTION</u>			
Presumptive Tinea versicolor	24		30
Candida albicans	775		798
Yeasts not C. albicans	2		125
Dermatophytes	40		48
Coccidioides immitis	-		1

continued TABLE VIII

	<u>1982/83</u>	<u>1983/84</u>
<u>C. ENTERIC SECTION</u>		
Shigella spp.:		
S. flexneri 1	1	2
S. flexneri 2	147	46
S. flexneri 3	3	5
S. flexneri 4	0	2
S. flexneri X	2	0
S. flexneri Y	4	1
S. sonnei	39	597
Salmonellae:		
S. Group B undifferentiated	11	1
S. agona	16	55
S. brandenburg	15	2
S. heidelberg	31	24
S. paratyphi B	2	0
S. saint paul	13	9
S. schwarzengrund	17	25
S. typhi	10	6
S. typhimurium	92	94
S. bareilly	1	1
S. infantis	32	10
S. montevideo	-	9
S. thompson	17	21
S. virchow	1	0
S. Group C ₂ undifferentiated	1	0
S. blockley	2	0
S. haardt	6	0
S. litchfield	0	1
S. muenchen	17	38
S. newport	9	32
S. Group D undifferentiated	1	0
S. dublin	1	0
S. enteritidis	9	26
S. anatum	2	0
S. havana	0	1
S. cerro	0	4
S. albany	1	0
S. rubislow	4	3
S. bredeney	0	5
S. hadar	0	2
S. ohio	8	1
S. panama	1	2
S. java	0	8
S. london	0	3
S. cremieu	0	1
S. othmarschen	0	1
S. oranienburg	0	2

continued TABLE VIII

	<u>1982/83</u>	<u>1983/84</u>
Salmonellae:		
S. johannesburg	0	1
S. mbandaka	0	1
S. java monophasic	0	1
S. non-motile	0	1
S. krefeld	0	2
S. derby	2	2
S. melaegridis	4	0
S. breanderap	2	0
S. untypable	2	7
S. tennessee	2	0
S. new brunswick	11	0
S. bovis morbificans	2	0
S. californica	1	0
S. virchow	1	0
S. anagee	2	0
S. lomalinga	1	0
S. miami	1	7
S. Group C	1	0
S. paratyphi A	1	2
S. san diego	0	1
S. Subgroup IV	0	3
S. species	0	15
Escherichia Coli Group:		
0111:K58	12	28
0119:K69	20	6
0124:K72	2	0
0125:K70	18	20
0126:K71	12	18
0127a:K63	0	1
0128:K67	17	20
026:K60	26	8
055:K59	26	32
086:K61	5	0
untypable	1	0
0142:K86	1	0
08:K25	1	0
086a:K61	0	6
0113:K75	0	1
06:NM	0	1
non-enteropathogenic	0	27
"rough", untypable	0	2

continued TABLE VIII

	<u>1982/83</u>	<u>1983/84</u>
<i>Campylobacter fetus</i> s.s. jejuni	236	186
<i>Yersinia enterocolitica</i>	11	26
<i>Aeromonas hydrophila</i>	166	235
<i>Plesiomonas shigelloides</i>	11	9
 <u>D. S.T.D. SECTION</u>		
<i>N. gonorrhoea</i>	1703	1358
<i>Chlamydia trachomatis</i>	877	703
<i>Trichomonas vaginalis</i>	not recorded	221
<i>G. vaginalis</i>	1192	1778
 <u>E. MISCELLANEOUS</u>		
<i>C. difficile</i> (63 were positive for toxin)	not recorded	123
Streptococci Group A	1746	2014
Streptococci Group B	685	1069
<i>N. meningitidis</i>	14	18
<i>Brucella melitensis</i>	0	3
<i>Listeria monocytogenes</i>	0	2
<i>H. ducreyi</i>	0	1

TABLE IX

Z RESISTANCE OF SELECTED ISOLATES TO SELECTED ANTIBIOTICS

ORGANISM	N U M B E R	A M P	T E R A	C O I T R I M	C A R B	C E F A M	C E F P	N A L A C	E R Y T H	C E F O X	G E N T	N I T R O	P E N G	N E T I L	C L O X	C L I N D	C H L O R
<i>A. anitratum</i>	76	80	19	9			95	0			3	100	100	0			
<i>A. lwoffii</i>	103	26	6	20			72	20			2	90					
<i>A. hydrophila</i>	219	97	6	13			54				<1						2
<i>C. freundii</i>	66	70	23	28			58	6			3	50					
<i>E. agglomerans</i>	47	68	26	8			32	8			0	8					
<i>E. cloacae</i>	129	88	12	12			93	3			<1	48					
<i>E. coli</i>	2571	47	20	24		75	24	3		25	<1	3		9			0
<i>K. oxytoca</i>	111	96	5	5		0	10	0		0	0	9					
<i>K. pneumoniae</i>	268	94	8	15			6	4		0	<1	45					
<i>M. morganii</i>	41	98	27	12			93	6		0	0	88					
<i>Moraxella</i> sp.	43	16	5	0			9			0	0						
<i>P. mirabilis</i>	208	34	97	5			1	10		0	0	94					
<i>P. vulgaris</i>	16	94	56	11			80	11		0	0	89					
<i>P. aeruginosa</i>	142				16						12		22				
<i>P. maltophilia</i>	17				47						38		41				
<i>P. stutzeri</i>	18				31						6		6				
<i>S. typhi</i>	3	0	0	0							0		0				0
<i>S. agona</i>	25	0	4	0							0		0				0
<i>S. enteritidis</i>	17	0	0	0							0		0				0
<i>S. menuehen</i>	18	0	0	0							0		0				0
<i>S. newport</i>	12	0	0	0							0		0				0
<i>S. schwarzengrund</i>	13	0	15	0							0		0				0
<i>S. typhimurium</i>	42	7	12	7							5						5
<i>S. liquefaciens</i>	13	62	0	33			100	0			0	100					
<i>S. marcescens</i>	21	100	55	40			100	25			5	75					
<i>S. flex 2</i>	27	26	56	22							4						
<i>S. sonnei</i>	449	98	<1	94			31	0			0	0					4
<i>S. aureus</i>	2478						<1		9		5						1
<i>S. fecalis</i>	405	3	65	19			39	97	34		15	5	91		<1	1	
<i>S. saprophyticus</i>	88						1		47		3		73		24	1	
<i>Y. enterocolitica</i>	9	100	11	0			100				0						11

TABLE X

CADHAM PROVINCIAL LABORATORY

VIRUS ISOLATIONS

April 1/83 - March 31/84

	<u>1982/83</u>	<u>1983/84</u>
<u>ENTEROVIRUS GROUP</u>		
Polio 1	25	24
Polio 2	29	33
Polio 3	26	22
Polio Mixed	8	-
Polio Viruses Isolated	88	79
<u>COXSACKIE</u>		
A9	4	2
A13	1	1
A16	-	1
B1	-	1
B3	1	13
B4	9	75
B5	1	8
Coxsackie Viruses Isolated	16	101
<u>ECHO</u>		
1	3	3
2	5	-
3	23	-
4	1	-
6	1	-
9	0	18
11	1	43
14	3	9
17	2	1
18	-	2
21	1	-
22	16	47
23	1	-
24	1	-
25	2	-
30	2	1
Echo Viruses Isolated	62	124
Unconfirmed	30	-
Not Typed	1	4

continued TABLE XVIRUS ISOLATIONS

	<u>1982/83</u>	<u>1983/84</u>
<u>RESPIRATORY VIRUS</u>		
Influenza A	2	32
A H ₁ N ₁	-	8
A Oregon-like	37	-
A Philippines-like	3	-
Influenza B	-	4
B Singapore-like	22	5
B Singapore strain	-	1
<u>Parainfluenza</u>		
Type 1	1	4
Type 2	1	6
Type 3	21	21
<u>Adenovirus</u>		
Type 1	31	31
Type 2	61	17
Type 3	14	18
Type 4	2	5
Type 5	6	5
Type 6	3	2
Type 7	10	34
Unconfirmed	30	-
Not Typed	19	1
Myxovirus Unidentified	1	-
Respiratory Syncytial Virus	16	23
<u>MISCELLANEOUS</u>		
Reovirus	6	-
Type Unknown	1	-
Type 2	3	3
Type 3	1	-
Mumps	2	-
Rubella	1	-
<u>HERPES</u>		
Varicella Zoster	18	30
Cytomegalovirus	63	42
Herpes Simplex	928	1378
Herpes Simplex Type 1	-	10
Type 2	-	6

continued TABLE X

VIRUS ISOLATIONS

	<u>1982/83</u>	<u>1983/84</u>
<u>ELECTRON MICROSCOPY</u>		
Rotavirus	139	189
Adenovirus	54	41
Herpes	24	20
Small Round Enteric	63	66
Corona	3	5
REO	1	1
Poxvirus	-	3
Calicivirus	-	1
Molluscum Contagiosum	1	1
Herpes-like Particles	-	1
Rota and SREV	3	-
Adeno and SREV	8	-
<u>FLUORESCENT MICROSCOPY</u>		
Herpes Simplex	12	14
Herpes Simplex Type 2	-	3
Herpes Zoster	-	2
Influenza A	-	7
Influenza B	-	1
<u>COUNTER IMMUNOELECTROPHORESIS</u>		
Positive Rotavirus	78	-
<u>LATEX AGGLUTINATION</u>		
Positive Rotavirus	-	117

TABLE XI
ENVIRONMENTAL MICROBIOLOGY

1982/83 - 1983/84

A. Routine

Water:		
Membrane Filtration	37,725	78,578
Most Probable Number	5,992	
Swab Rinse	173	260
Food:		
Surveillance	2,051	7,701
Outbreaks	534	
TOTAL:	46,475	86,539

B. Special Projects

Virus:		371
Water	240	
Wastewater	57	
Other, i.e.,: soil, quality control	74	
Special Bacteria:	1,824	2,765
Air Sampling - Roblin		90
Antibiotic Sensitivities		1,212
Salmonella		938
Iron Bacteria		17
Shigella		192
Aeromonas		4
Pseudomonas		94
Egg Wash		5
Legionnaires Bacteria		91
Fungus		75
Quality Control		41
Miscellaneous		6
Research and Development	6,326	9,569
Western Equine Encephalitis		See Table
Mouse Inoculation	1,714	XII
Tissue Culture	1,499	
Arbovirus Serology Surveillance	2,509	See Table
		XII
Miscellaneous	605	

TABLE XII
ENVIRONMENTAL MICROBIOLOGY
Arboviruses 1982/83 and 1983/84

		<u>First of April 1982/83</u>		<u>First of April 1983/84</u>	
		Number Tested	Percentage Positive	Number of Positive/ No. tested	Percentage Positive (No. Pos.)
<u>1. Surveillance (WEE)</u>					
a. Serology					
Sentinel Chickens	1175	0		1318	33% (272)
Community Chickens	0	0		152	2.6 (4)
Miscellaneous					
Turkey	0	0		2	0
Snakes	18	0		0	0
Ground Squirrels	29	7		0	0
Rats	6	0		0	0
Frogs	20	3		0	0
Pigeons	4	0		29	3 (1)
Geese	0	0		10	10 (1)
Pheasants	0	0		2	100 (3)
Sparrows	0	0		199	8.5 (17)
Humans (sero-survey)	277	9%	(25)	130	3.8 (5)
		Number of Pools Tested	Number Positive	No. Tested	Number Positive
B. Virus Isolation					
from mosquito pools	822	1 (HPF)		1633	72 (50 WEE)
					(6 CV)
					(2 CE)
					(14 HPF)
<u>2. Diagnostic</u>					
Humans	231	1 (Dengue)		855	18 (WEE)
Horses (WEE)	13	1		47	23

WEE - Western Equine Encephalitis

CV - Cache Valley

CE - California Encephalitis

HPF - Hart Park Flanders

* BASED ON 4 FOLD INCREASE TITRES OR PRESENCE OF SPECIFIC IgM ANTIBODY

TABLE XIII

SEROLOGY
SYPHILIS SEROLOGY

	<u>1982 - 1983</u>		<u>1983 - 1984</u>	
	Number of Specimens	Number Reactive	Number of Specimens	Number Reactive
Bloods	86,744	2,411	71,960	851
CSF	813	0	458	10
DFA	74	0	42	0

SYPHILIS SEROLOGY
 DETAILS OF 1983 - 84

	Number of Sera Tested	Number of Sera Positive	Number of Persons With Previous History	Number of New Cases	Number Possible New cases (no Previous Info.)
Syphilis	71,960	851	743	23	85

BACTERIAL AND MISCELLANEOUS SEROLOGY

	<u>1982 - 1983</u>			<u>1983 - 1984</u>		
	Number Tested	Number Positive	Percent	Number Tested	Number Positive	Percent
Rheumatoid Factor	1,986	195	9.8	1,546	120	7.8
CRP	377	113	30.2	239	81	33.9
WIDAL	385	N/A	N/A	129	21	16.3
Brucella abortus	532	35	6.6	386	23	6.0
Thyroid:						
Thyroglobulin Ab	190	N/A	N/A	108	14	13.0
Microsomal Ab	195	N/A	N/A	108	31	28.7
Pasteurella tularensis	17	N/A	N/A	33	4	12.1
Antinuclear Factor	-	-	-	199	14	7.0

(3 month
period)

continued TABLE XIII

RUBELLA SEROLOGY

A. NUMBER OF RUBELLA TESTS:

	<u>1982 - 1983</u>	<u>1983 - 1984</u>
PHA	37,964	34,199
HI	7,275	6,084
IgM	131	483

B. DETAILS OF PRENATAL SURVEILLANCE: 1983 - 84

	<u>Number Tested</u>	<u>Number Susceptible</u>	<u>%</u>
PHA	17,157	592	3.5

C. DETAILS OF RUBELLA DIAGNOSTIC TESTING:

	<u>1982 - 1983</u>			<u>1983 - 1984</u>		
<u>TEST</u>	<u>Number Tested</u>	<u>Number With 4-fold Rise</u>	<u>%</u>	<u>Number Tested</u>	<u>Number With 4-fold Rise</u>	<u>%</u>
HI	4,403	117	2.7	4,289	143	3.3
	<u>Number Tested</u>	<u>Number with IgM Present</u>	<u>%</u>	<u>Number Tested</u>	<u>Number with IgM Present</u>	<u>%</u>
IgM	131	36	27.4	483	114	23.6

IMMUNE STATUS SEROLOGY

	<u>1982 - 1983</u>	<u>1983 - 1984</u>
	<u>Number Tested</u>	<u>Number Tested</u>
Measles	2,574	1,982
Mumps	2,392	2,015
Diphtheria	523	386
Tetanus	494	361
Pertussis	381	169

continued TABLE XIII

HERPES SEROLOGY

HERPES VIRUS GROUPS:

1983 - 1984

	<u>Number of Paired Sera Tested</u>	<u>Seroconversions</u>	<u>High Static</u>
Herpes simplex	1,150	58	114
Herpes zoster	885	31	45
Cytomegalovirus	1,361	16	9

	<u>Number of Sera Tested</u>	<u>Number Positive</u>
Epstein Barr - IgM	2,381	142

MISCELLANEOUS VIRUS SEROLOGY

1983 - 1984

	<u>Number of Paired Sera Tested</u>	<u>Seroconversions</u>	<u>High Static</u>
Measles	497	8	7
Mumps	149	4	-
RMSF	22	-	-
Lymphochoriomeningitis	8	-	-
Rotavirus	188	4	1

continued TABLE XIII

RESPIRATORY SEROLOGY

1983 - 1984

	<u>Number Tested</u>	<u>Number Positive</u>
ASOT	2,264	459
ADB	2,015	836
Cold Agglutinins	603	18
Infectious Mononucleosis		
Spot Tests	2,975	126

	<u>Number of Paired Sera Tested</u>	<u>Seroconversions</u>	<u>High Static</u>
ADENO	2,768	12	8
RSV	2,768	15	7
Parainfluenza 1	2,768	5	7
Parainfluenza 2	2,768	5	1
Parainfluenza 3	2,768	2	4
Influenza A	2,768	32	11
Influenza B	2,768	17	5
Mycoplasma pneumonia	2,768	49	50
Legionella spp.	338	7	15
Chlamydia spp.	220	1	4
Q-fever	37	0	4

continued TABLE XIII

HEPATITIS SEROLOGY

<u>Hepatitis</u>	<u>1982 - 1983</u>			<u>1983 - 1984</u>		
	<u>Number Tested</u>	<u>Number Positive</u>	<u>%</u>	<u>Number Tested</u>	<u>Number Positive</u>	<u>%</u>
HBsAg	10,005	534	5.3	9,765	460	4.7
Anti HBc	2,938	674	22.9	2,972	619	20.8
Anti HBs	2,506	573	22.9	3,499	892	25.9
HBeAg	541	129	23.8	477	89	20.0
Anti HBe	538	128	23.8	446	106	23.8
RPHA	1,220	N/A	N/A	1,095	N/A	N/A
IgM HAV	2,338	352	15.1	3,607	553	15.3
IgG/IgM HAV	940	320	34.0	1,630	521	32.0

TOXOPLASMOSIS SEROLOGY

	<u>1982 - 1983</u>	<u>1983 - 1984</u>
	<u>Number of Tests</u>	<u>Number of Tests</u>
PHA	11,855	12,514
IFA	2,384	2,137
IgM	105	117

TABLE XIV

PARASITOLOGY

	<u>1982 - 83</u>	<u>1982 - 83</u>
Number of Stools Tested	8,729	10,911
<u>Number of Parasites Identified:</u>		
<u>Protozoa - Pathogenic</u>		
Dientamoeba fragilis	31	14
Entamoeba histolytica	105	131
Giardia lamblia	403	320
Plasmodium vivax	11	18
<u>Non-Pathogenic</u>		
Blastocystis hominis	575	384
Chilomastix mesnili	39	23
Entamoeba coli	475	417
Entamoeba hartmanni	88	92
Endolimax nana	305	242
Iodamoeba butschlii	26	38
<u>Trematodes</u>		
Chlonorchis/Metagonimus/		
Heterophyes/Opisthorchis/Methorchis	18	12
Schistosoma spp.	1	10
<u>Cestodes</u>		
Diphyllobothrium latum:		
ova -	34	8
segments -	9	3
Hymenolepis nana	8	3
Taenia spp.: ova -	4	2
segments -	2	1
<u>Nematodes</u>		
Ascaris lumbricoides: ova	40	57
adults	8	17
Enterobius vermicularis:		
ova	8	9
adults	0	2
Hookworm spp.	106	94
Strongyloides stercoralis	12	2
Trichostrongylus	4	0
Trichuris trichiura	151	97
<u>Arthropods</u>		
Louse	1	1
Nit	3	1
Mites	1	0
Ticks	1	2

TABLE XV
METABOLIC DISEASES FINDINGS
MARCH 31, 1984

	1982/83	1983/84	Total Positive Findings, 1965 to March 31/84
P.K.U.	2	-	14
Galactosemia	-	1	3
Prolinemia	-	-	3
Histidinemia	-	2	11
Maple Syrup Urine Disease	-	-	1
Tyrosinemia	-	-	1
Hypothyroidism	4	4	19
TBC Deficiency	-	-	1
Transient Hypothyroidism	-	-	2
Lingual Thyroid	-	-	1
Cystinuria	3	1	5
Glycinemia	-	-	1
Hartnup Disease	2	-	3
TOTALS OF ALL DISEASES DETECTED:	11	9	65